THE

FARMER'S MAGAZINE:

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(No. XXIII.)

BRANCH I.

ORIGINAL COMMUNICATIONS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Equalization of Weights and Meaſures.

SIR,

THE general equalization of weights and meaſures, ſo often talked of, but little perhaps to be expected in this country when we conſider the fate of a late attempt, deſerves yet not to be abandoned. It is certainly a practicable meaſure, from what has been done in France; and, though difficult to bring to perfection, may nevertheleſs be ſuſceptible of ſuch a melioration as to contribute highly to the facility of commercial intercourſe, which is all that ought, perhaps, to be aimed at. The preſent time may even be conſidered as not unpropitious to ſo deſirable a purpoſe. War, notwithſtanding of all its horrors, is yet promotive of energy; and nothing ſeems wanting to aid this neceſſary quality, in any arduous undertaking, but a ſort of unyielding perſeverance, which diſdains to be baffled by oppoſition or difficulty.

If war ſhould thus preſent no unſurmountable barrier to ſuch an end, but ſhould even be thought to favour its ſucceſs, how much more is the argument ſtrengthened by the late ſettlement in Ireland? What an impoſing aſpect would it aſſume, now that the union is perfected?

A regulation of this kind is certainly the wiſh of numbers; but, unleſs it ſhall pervade the minds of our men of buſineſs in either Houſe with that ſolicitude which its importance demands, we cannot expect to ſee it carried.

Suppoſe an attempt were made at improvement 'in a ſmall

way.' Suppoſe, when perpetual references are made to weights and meaſures; when buſhels, barrels, and bolls dance the hays in quarterly confuſion; ſuppoſe it were intimated by you, Sir, as your *ſerious wiſh*, that your correſpondents ſhould in future, *on all occaſions, reduce their calculations uniformly to avoirdupois weight and the Wincheſter buſhel*; and ſuppoſe this intimation were repeated, in four ſucceſſive Numbers, among the 'notices to correſpondents;' you would be gratified, I doubt not, with a willing obedience, and your readers, even the moſt commercial, would be ſaved from the puzzling effects of the preſent practice, and in many inſtances from error. My ſuggeſtion of Engliſh weights and meaſures proceeds from no partiality to the uſages of that part of the country in preference to yours, but from an idea that, as your paper circulates generally over South Britain and Ireland, it may ſeem right to adopt the weight and meaſure of the larger number of the inhabitants.

It would require a Dictionary, of not a ſmall bulk, to explain the differences of weights and meaſures, but more particularly of the latter, that prevail in Great Britain and Ireland. So ſtrangely diſſonant are theſe, that neighbouring counties differ from each other. But this ought not to create ſurpriſe, ſince three ancient kingdoms, with all their regulations in their train, are now happily blended into one; more eſpecially when it is conſidered that theſe empires have in former times been ſplit into many more, holding cuſtoms peculiar to themſelves; and thus Britiſh, Pictiſh, Iriſh, Scotiſh, Saxon, Daniſh and Norman uſages meet each other, and 'joſtle in the dark.'

Should you, Sir, concur in this ſentiment, and think that a complete uniformity in giving weights and meaſures by your correſpondents, to be ſerviceable to the diffuſion of that kind of knowledge, which it ſeems to be your ambition to attain, it may not be deemed very preſumptuous to ſay, that ſome of our Senators, who are your readers, ſeeing the eaſe and perſpicuity which this meaſure will produce in your book, may be invited to make another effort, and, by legiſlative authority, endeavour to arrange a ſyſtem of univerſal ſimplicity *—ONE WEIGHT and ONE MEASURE throughout the whole extent of our ſiſter iſlands.

I am, Sir, your obedient ſervant,

** I.

FOR

* The uſe of tens for multipliers would be an eaſe to buſineſs. *E. G.* 10 grains = 1 ſcruple; 10 ſcruples = 1 drachm; 10 drachms = 1 ounce; 10 ounces = 1 lib.; 10 lib. = 1 ſtone; 10 ſtones = 1 cwt.

FOR THE FARMER'S MAGAZINE.

LETTER II.

In my firſt letter, No. XXII. p. 166, &c. I detailed the different operations neceſſary in the culture of turnips, both on light and heavy ſoils, and ſhall now proceed to offer my opinion concerning the moſt convenient and profitable mode of conſuming the crop, together with a ſlight ſketch of the ſubſequent management of land which has carried that valuable root.

On heavy ſoils, it is hardly poſſible to have turnips eaten by ſheep upon the land where they grow. The ſoil in winter, from rain and ſnow, gets wet and poaches, which injures it extremely for the ſubſequent crop. Indeed wet land never recovers from the evil effect of poaching, until after a regular fallow. Likewiſe, on ſuch land the ſheep ſtand and lye always wet, in which ſtate their food does not improve them. Therefore, if the turnips of ſuch ſoils are to be given to ſheep, they muſt be carted off to ſome adjoining field of lea, or graſs of at leaſt two years old; always taking care, as much as poſſible, to drive the carts upon the crown of the ridges, as being the drieſt of the land.

On ſome grounds very much inclined to wet, and conſequently very apt to poach, I have known the turnips carried off in creels or paniers on horſeback, nay, even on peoples' backs. This is only neceſſary in ſoft weather: During froſt of any firmneſs, carts may readily be admitted.

If to be uſed for feeding cattle in the houſe or yard, the ſame precautions in carrying off the turnips becomes equally neceſſary. Perhaps ſledges or hurdles, drawn by one horſe, might anſwer for carrying turnips from ſuch ſoils, better than carts, as not ſo liable to ſink into the ground.

In conſuming turnips which grow upon free, dry ſoils, the ſame cautious management is by no means neceſſary in the ſmalleſt degree. On ſuch ſoils, ſheep may, with great ſafety and propriety, be employed to eat them on the ground where they grow. This ſaves a vaſt deal of trouble and expence, for carting them off; the ſheep thrive and improve equally well, by eating the turnips in this ſituation, as if they were carted off for them elſewhere; and the ſoil is very much ameliorated and enriched, by the dung and urine of the ſheep, and by the pattering of their feet.

In this caſe, the ſheep are to be confined by nets or ſlakes, hurdles or gates, ſo as only to get the turnips in moderate por-

tions at once, ſufficient to laſt them a week or two at a time, and ſo on progreſſively till the whole be eaten off, being always allowed the liberty of the bare ground, from which the turnips have been already eaten. This enables them to chuſe a dry place at all times to lye down upon for rumination or ſleep; and is of great advantage, eſpecially in rainy weather, or when the ſnow is melting. When one break is eaten off, an additional portion of freſh turnips is to be given them; and the ſhells, or remains of the old break, are to be picked out of the ground, that the whole may be eaten up: Or the ſhells may be carted off to another field, for ſheep that are not then meant to be fattened; or to give to young cattle, either on another field, or in the houſe, ſheds, or ſtraw-yard.

If the ſoil, where the turnips grow, is tolerably fertile, and has been previouſly well manured, one half of the turnips may be carted off, in ſtripes of ſix or eight drills each, leaving ſimilar ſtripes undrawn, to be eaten by ſheep on the ground. Thoſe led off may be given to cattle in the houſe or ſtraw yard, or to ſheep on a graſs or ſtubble field ſeparately, and the turnip field will be ſufficiently enriched. Indeed, upon good ſoil, this plan is much preferable to eating the whole on the ground, leſt the ſoil become too rich, and cauſe the ſubſequent crop of corn to lodge, by which the grain will be very much injured, and the young graſs, growing under it, may be ſuffocated and deſtroyed.

It may now be proper to give a ſlight ſketch of the ſubſequent management of land under the turnip huſbandry.

If the ſoil is good, ſo much of the land as is cleared, by having the turnips eaten off before the middle of March, may very properly be ſown with wheat, after once ploughing, either drilled or broad caſt. So much of the land as is later in the ſeaſon of being cleared, muſt be cropped with barley or oats, after once ploughing; and theſe likewiſe may either be ſown in drills or broad caſt.

Whatever grain may have been ſown after the turnip crop, the land ought always to be ſown off with rye graſs and clover; for it ought to be an invariable rule in huſbandry, to lay down land to graſs in good condition, both as to cleanneſs and richneſs.

The cuſtomary mixture of graſs ſeeds, for dry turnip ſoils in good condition, is rather leſs than a Wincheſter buſhel of good clean rye graſs ſeeds, ten pounds of red clover, and two pounds of white clover, to the Engliſh ſtatute acre. To this ſome add two pounds of yellow clover, and one pound of rib graſs, proportionally diminiſhing the quantity of red clover.

This

This is a very proper mixture, if the land is meant to remain in graſs for two years or more. But, if for one year only, there is no occaſion for any other ſeed, beſides rye graſs and red clover; and half a buſhel of good rye graſs to the acre will be quite enough, with twelve pounds of red clover.

After the land has been one or more years in graſs, it may be broken up for oats, which may be immediately ſucceeded by turnips, and theſe again, as before, by wheat, barley, or oats, with graſs ſeeds.

But as this plan may throw rather a larger proportion of the farm into turnips, than dung can be procured for, a crop of drilled beans or peas may be interpoſed between the oat crop following lea, and the ſubſequent turnip one.

If the ſoil is very good, and in high condition, the graſs may be eaten bare about the end of July, then broken up, worked as fallow, and ſown with wheat in October or November. Where this plan is meant to be followed, the graſs ſeed mixture ought to have very little, perhaps no rye graſs. Fourteen or ſixteen pounds of red clover to the Engliſh ſtatute acre may, in this caſe, be neceſſary; and according to this plan, the graſs ought to be eaten by ſheep, which may be folded on, in the way directed for eating off turnips. In this caſe, the wheat ought invariably to be followed by turnips, to reſtore fertility to the ſoil.

Though an enemy to rigid ſyſtems of rotation, becauſe failures of particular crops, eſpecially of the graſs one, may render them impoſſible to be punctually followed; yet, on every well conducted farm, there ought to be ſome rule or principle of management. One general rule is or ought to be, to have as much of the land in turnips as can be properly worked and manured. A ſecond is, to keep as much of the land in graſs, paſtured by ſheep, as will continue to be profitable. A third, never, upon any account, to have two white corn crops in ſucceſſion.

On theſe principles, the following ſyſtems of rotation may be held in view, as directions, not as abſolute laws of proceeding.

1ſt,

1. year, Oats, or Wheat, from Lea.
2. —— Turnips, with Dung.
3. —— Wheat, Barley, or Oats, with Graſs Seeds.
4. —— Graſs: and round again as before.

This is a very good plan near a large town, where dung may be purchaſed, or on the ſea coaſt, where ſea weed can be procured. If the lea is broken up by what is called a rag fallow for

wheat, in the firſt year, wheat certainly ought not to form the crop of the third year. I have ſucceeded with two wheat crops in one rotation; but do not think it a ſafe practice.

In that ſucceſsful caſe, the firſt wheat crop followed drilled beans, which had a thin dunging: This was immediately ſucceeded by well dunged turnips, eaten by ſheep; and that again by wheat and graſs ſeeds. This ſecond wheat crop produced twenty-two Wincheſter buſhels from each Engliſh acre.

2d,

1. year, Oats, or Wheat, from Lea.
2. —— Turnips, with Dung.
3. —— Wheat, Barley, or Oats, with Graſs Seeds.
4. —— Graſs.
5. —— Graſs: and ſo round again.

Or, *3d,*

1. year, Oats, or Wheat, from Lea.
2. —— Drilled Peas or Beans.
3. —— Turnips, with Dung.
4. —— Wheat, Barley, or Oats, with Graſs Seeds.
5. —— Graſs: and ſo round again.

Either of theſe are very good rotations, where no dung can be purchaſed, nor ſea weed procured; as requiring only that one fifth part of the farm be dunged annually. The ſame rule, of not having two wheat crops in one rotation, is applicable here, as in the firſt ſyſtem. Indeed, in the former of theſe two, where two crops of graſs ſucceed each other, in the fourth and fifth years, it will not be proper to take wheat in the firſt year of the ſubſequent rotation; becauſe it is found that wheat, in general, does not ſucceed immediately after graſs of more than one year old.

It has been already mentioned, that the graſs crop of a rotation ſometimes fails. In this caſe, perhaps, the beſt plan is to ſubſtitute drilled peas, followed by barley or oats, and graſs ſeeds; and the amended rotation will then ſtand thus:

4th,

1. year, Oats after Lea.
2. —— Turnips, with Dung.
3. —— Wheat, Barley, or Oats, with Graſs Seed; which having failed,
4. —— Peas or Beans drilled.
5. —— Barley, or Oats, and Graſs Seeds.
6. —— Graſs.

I have heard of a rotation being followed in Norfolk, ſomething like the following:

5th,

1. year, Drilled or dibbled Peas, from one year old Lea.
2. —— Wheat.
3. —— Turnips, with Dung.
4. —— Barley, or Oats, with Grass Seeds.
5. —— Grass: and so round again.

On weak lands, where no dung can be purchased, nor any sea weed procured; or where the landlord insists upon half of the land being in grass, which is often the case, especially for the last five years of a lease, the following system will answer the purpose extremely well, but still liable to the accident of the grass crop failing to grow, or dying out in the second or third year.

6th,

1. year, Oats, or Wheat, from Lea.
2. —— Turnips, with Dung.
3. —— Wheat, Barley, or Oats, with Grass Seeds.
4. —— Grass.
5. —— Grass. } All pastured.
6. —— Grass.

It may be proper to mention the method of raising turnip seed. Having procured good seed, as proved by the size, shape, and hardiness of the turnips, select, early in spring, a cart load of the best, chosen by regularity of shape, convexity of the top, and smallness of neck. Transplant these upon a piece of good dry rich soil, at proper intervals, and allow them to ripen their seed, which will be in July or August. Watch them well from birds, when nearly ripe, and afterwards while drying. Cut the seed stems before the seed is dead ripe, tie into sheaves with straw ropes, and win or dry completely. It may then either be preserved unthrashed, in a small well covered rick, or some convenient out-house, till next season; or thrashed out, and preserved in a granary. Next year preserve the whole produce of this transplanted seed, and renew it in this manner every two or three years. It has been fully experienced, that turnip seed repeatedly grown without having been transplanted, is very apt to degenerate. The soil on which turnips ripen their seed, is very much impoverished, and will require to be well manured afterwards.

In many parts of England, hay from old grass land is a very essential part of farm produce; and, in such situations, a vast quantity of dung is employed as top dressing, for the production of hay. It is even a very common condition in leases to lay the whole farm dung on the hay lands; and consequently the arable land is limited, for manure, to such dung, or other substitutes as can be purchased

elſewhere. Hence a variety of contrivances have been fallen upon, as ſubſtitutes for farm yard dung. But in Scotland, where horſes, for the mere purpoſes of luxury, or convenience, or traffic, are not ſo immenſely numerous as in England, the demand for hay does not require ſo large a proportion of land to be employed in that way; conſequently the farm yard manure, generally ſpeaking, ſuffices for the arable part of farms, where almoſt only ſuch manure is applied, excepting the addition of lime, or marl, or ſhell ſand, or ſea weed, according to ſituation.

Rape duſt is the cake or maſh from which rape oil has been expreſſed, reduced into a groſs powder by a mill ſimilar to that for grinding tan-bark. It may be applied to the land, by ſowing it by hand from a ſheet, juſt before forming the drills upon which the turnip ſeed is to be ſown. In Norfolk, they have a compound drill machine for this purpoſe, which diſtributes the rape duſt in ſmall portions into the ſeed ſlits, at the ſame time with the turnip ſeed, thereby applying this manure, which is reported to be very potent, but of ſhort continuance, exactly to the ſeeds. It is ſaid that one ton is ſufficient to inſure a good crop of turnips upon five acres of ground, where the drills, or rather rows, of turnips are only eight or ten inches aſunder. Conſequently, where they are raiſed in drills at twenty-eight inches diſtance, the ſame quantity of rape duſt ought to ſuffice for a proportionally larger extent of ground.

The ſhort continuance of the fertilizing quality of rape duſt is no objection in the turnip huſbandry. Sea weed, the moſt valuable of manures, is exactly in the ſame predicament. For, if a crop of turnips can be ſecured upon fit ſoil, after fertility is abſolutely aſcertained, by conſuming the crop on the ground by ſheep, as already obſerved, the ſoil is rendered greatly productive, both of corn and graſs, and thereby the continuance of fertility is likewiſe inſured, as, by good corn crops, and good graſs, either for hay or paſture, an after abundance of farm yard dung, or of fertile lea, wherefrom to raiſe good crops of corn, and conſequently increaſe the quantity of dung, can never be wanting.

Into this country, ſome years ago, a variety of rye graſs, which only grew for one year, was introduced; from the uſe of which, very great inconvenience has been experienced, as, in general, land, with us, is continued in graſs for three years, ſometimes longer. It is unfortunate that there is no means of diſtinguiſhing this annual rye graſs from that which is perennial; as otherwiſe they might be uſed according to the future intentions of managing the land. The annual is ſuppoſed even to grow more luxuriantly during its ſolitary year, and would anſwer admirably where

where one year of grass only was required; but no more crop is to be expected in the second year, than may be produced from fallen seed.

Where land is to be laid down to permanent grass, for two or more years, especial care must be taken to procure perennial seed. For which purpose, it ought to be procured from a respectable farmer, who can vouch that the seed is saved from a second year's crop.

With rye grass seed, as with the seeds of all other grains, I should consider a regular change, from soils of opposite description to that upon which it is intended to be propagated, to be attended with beneficial consequences. Every time of sowing this may not be necessary; but I am convinced that, universally, in agriculture, it is advisable to vary the crops upon the same soil, and to exchange seeds of all kinds alternately, from strong to light, and from light to strong.

It is of the utmost importance to know that rye grass seed be free from mixture of other seeds. Many careless agriculturists content themselves with the sweepings of hay-lofts which they can procure cheap, under the name of grass seeds. Not to mention goose-grass, which any attentive person can detect, and which is a very coarse grass, I am satisfied that great quantities of bulbous rooted oat grass, and couch or quicken, are sown every year, to the great injury of the farmer, by coarse hay, and by introducing immense abundance of their vivacious roots into the soil, requiring afterwards great care and expence to eradicate. On my entry here, I saved a field of hay, almost entirely composed of couch, which I have no doubt had been sown by my predecessor, with seed saved from hay purchased on the slovenly-managed burgess-meadows of Berwick, or bought from the stable-keepers of that place. I this season refused, at a very moderate price, an acre of the finest rye grass I ever saw in seed, certainly second year's crop, merely on account of a thin mixture of couch, evidently growing among the rye grass.

Having now completed, to the best of my knowledge and abilities, the task your friendship was good enough to suppose me equal to, I have only to wish it may prove as useful to your friend, as it has been agreeable to me in attempting to describe, and for a considerable number of years in executing practically upon my limited scale of agriculture.

I remain always, &c. &c.

Berwickshire, 15th November 1804. *R r.*

TO

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

SIR,

LAST ſummer was remarkable for the deſtruction occaſioned to the turnip crop by the caterpillar. Your correſpondent M., in laſt Magazine, mentions that he had ſucceſsfully got quit of that diſaſter, by rolling a field of turnips three times.

I have been informed that ſome eminent farmers make the caterpillar to be gathered by the hand and deſtroyed; and the following method is recommended by the late Mr Philip Miller, in his Gardener's Dictionary: The ſureſt method (he ſays) of deſtroying theſe inſects, is to turn a large parcel of poultry into the field, which ſhould be kept hungry, and turned in early in the morning. Theſe fowls will ſoon devour the inſects, and clear the turnips.

For the evil of the fly, he recommends ſowing ſoot along the ſurface of each drill as of ſome ſervice.

On the ſubject of turnips, Mr Miller, who wrote not much more than half a century ago, obſerves, that it was not then many years ſince the practice of ſowing turnips for feeding cattle was introduced into Great Britain, though it was a piece of huſbandry well known to the ancients. It would alſo appear from his book, that the ſowing of turnips in drills was only then diſcovered.

There has been another method (ſays he) practiſed very lately by ſome curious farmers, in cultivating turnips, which is, by ſowing the ſeed in rows with the drill-plough. In ſome places, the rows are ſown three feet aſunder, in others four, five, and ſix. The latter has been recommended by ſome as the moſt proper diſtance; and although the intervals are ſo large, yet the crop produced on an acre, has been much greater than upon the ſame quantity of land where the rows have been but half this diſtance; and upon all the fields which have been tilled, the crops have greatly exceeded thoſe which have been hand-hoed. The late Lord Townſend was at the expence of making the trial of theſe two different methods of huſbandry with the greateſt care, by equally dividing the ſame fields into different lands, which were alternately ſown in drills, and in broad-caſt. The latter were hoed by the hand, in the common method, and the others cultivated by the hoeing-plough; and when the roots were fully grown, his Lordſhip had an equal quantity of land, which had been ſowed in different methods, meaſured,

meaſured, and the roots drawn up and weighed; and thoſe roots which had been cultivated by the plough, were ſo much larger than the other, that the crop of one acre weighed a ton and a half more than that of an acre in the other huſbandry.

NOVICE junior.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Remarks on the Huſbandry of Ayrſhire, with ſome Suggeſtions for its Improvement.

SIR,

IN the Firſt Number of your Fifth Volume, I noticed, with much ſatisfaction, ſome obſervations on the improvement of the county of Ayr. No individual feels more pride in the rapid ſtrides which our farmers have made towards improvement; yet I am anxious that the many who read your publication ſhould be called upon to reflect, that their mode of farming (though wonderful, conſidering the depth from which they have emerged) is far from being ſuch as they ſhould aſpire to, or ſuch as their own intereſt and that of their country demands. Although the ſlothful and diſgraceful diſtinction of outfield and infield is nearly forgotten; although a liberal quantity of lime is carted and ſpread, inſtead of being carried in ſacks and ſcattered by the hand; although lands are reſted ſix years, inſtead of 'at leaſt one year,' (as ſome of the old tacks on my ſmall property provide, a clauſe which would better ſuit a tropical latitude, where the year ripens more harveſts than one); ſtill there is much to learn, and much to be done. For, although the farmers of Ayrſhire have, from an obſtinate, prejudiced race, burſt at once into an active, enterpriſing ſet of men, with better cattle and better implements, yet they have by no means got much beyond the infancy of that improvement which is requiſite. I beg leave to be underſtood to refer to the great number of cultivators of ſmall farms, which certainly form by far the greater proportion in the county of Ayr.

The late Mr Fairlie of Fairlie is juſtly celebrated for having commenced, and, by his influence with others, enforced a new ſyſtem of agriculture in Ayrſhire; a ſyſtem, which nothing but binding clauſes on ſtamped paper could at that time have forced into practice, but which has made a wonderful change on the face of a large tract of country. This ſyſtem, however, although of the higheſt importance at the time, could only be conſidered as a preliminary ſtep towards that degree of practical excellence in the method of cultivation, which the patriotic look forward

forward to with hopes, and which the industry and spirit of the farmers of Ayrshire, if properly directed, cannot fail to realize.

The leases which were granted in pursuance or imitation of Mr Fairlie's plan, supposed the farm divided into three parts or breaks, which were to fall under the plough in rotation, each third being successively limed at a given rate of from 500 to 600 Winchester bushels per acre. The tenant became bound to take only three crops; to sow down the third with rye-grass and clover for hay, and then to rest that division five years in pasture. Thus each break fell successively under the plough, and generally three crops of oats followed each other, with perhaps as much bear or barley the last year, as the tenant could command dung to manure. A more scourging system could scarcely be proposed; and nothing but the five years rest after four years white crop and hay could save moderate land from absolute sterility. In addition to this, I must remark, that it was usual to sow, as before mentioned, rye-grass and red clover, which being annual, or at most biennial seeds, left the land to nature for the herbage which was to supply the future pasture. This plan of operations, defective as it must appear, enabled the farmers to triple their old rents, and to begin to thrive; but from this rotation of crop they dared not to deviate, under a penalty of some pounds per acre. It is evident that, under such shackles, the good farmer and the bad, are on an equal footing. The bad, it is true, is debarred from adopting a worse mode of management; but the good is as completely precluded from attempting a better: the bad farmer is restrained from exhausting the most valuable part of his possession by excessive tillage, and then leaving it in that condition to the proprietor, whenever, from fraud or negligence, he becomes a bankrupt. But the industrious, thriving man, is shut out from all the benefits of change of crop, turnip-feeding and fallow; and the country at large loses the chance of those improvements which it is reasonable to suppose may suggest themselves to such men, left to their own free choice. Where such leases existed on my small property, I have not hesitated to give the tenant a written permission to deviate from this plan, where he shewed me that he had improvement in view; and in new leases, although the custom of the country forbade my giving the tenant a *carte blanche*, I have ventured as far as the present state of farming would permit; and, where I had any confidence in the integrity or skill of the man, have allowed him to use the farm as he thinks proper, provided he leaves one contiguous third, six years old, lea, at the close of the tack. Without this provision, if the tenant chooses to plough the whole of the farm, near the close of his lease, the proprietor must be contented with a lower rent for some

years

years from a ſucceeding tenant, until the land is again ripe for tillage. I ſhall not at preſent trouble you or your readers with my ideas on the beſt rotation of crops for clay ſoil, in a moiſt climate, but ſhall take the liberty of expreſſing my wiſhes, that ſome of your correſpondents, more able for the taſk, may anticipate what I intend to offer at ſome future opportunity; in the mean while, I entreat indulgence for preſenting the following hints to the farmers in this county, on four heads, viz. Straighting of Ridges, Sowing down for Paſture, Green Crop, and Straw Yards.

Straighting of Ridges.—The ſtraighting of ridges, as it buries part of the ſoil which had been long under culture, and brings up freſh mould, which requires to be expoſed ſome time to the atmoſphere before it becomes equally productive, is not a proceſs which proves very inviting to the farmer who looks for an immediate and productive crop. As, however, land is frequently ridged in a bad direction for carrying off the ſurface water, the ridges often twenty-five feet broad at one end, and ten or twelve at the other, which occaſion frequent and vexatious turnings and liftings of the plough, and are at the ſame time very inconvenient for the caſt of the ſower, ſtraighting of ridges becomes neceſſary for the ſake of abridging labour, independent of the look of the thing, and the advantage of having the ſoil more equally diſtributed. I am, however, of opinion, that it never can be ſo advantageouſly or effectually completed as by a green crop, after which the land ſhould be ridged up and ſown off for paſture. Croſs ploughing, I conſider as very hurtful in clay land, as it interrupts all the furrows, and the water muſt remain on the land. If land is croſs-ploughed, the old furrows ſhould be cleared to carry off the water in the interim.

Sowing off for Paſture.—Aſk any of our farmers from what he derives moſt profit, and he will anſwer, from butter and cheeſe; and yet ſcarcely one takes the neceſſary ſteps to ſecure good paſture. When I have urged the propriety of ſowing white clover, I have been told it is unneceſſary, as the land naturally produces it. Could there be a better reaſon, then, for ſowing it? for, if it is a native herb, it muſt ſucceed: The truth is, that in the fourth or fifth year of paſture, the land does naturally begin to produce white clover, and juſt when it begins to be vigorous, the farmer ploughs it down. Is it not an object to expedite the efforts of nature, by ſupplying abundance of the ſeed, and thus to gain in the ſecond year, what otherwiſe could not be expected till the fifth? It may therefore be proper to ſow off with perennial rye-graſs, white clover, rib-graſs, and (if it muſt be) a little red-clover. The common rye-graſs and clover, are only fit for one hay crop, and then to be ploughed down.

Green

Green Crop.—Under this head I ſhall confine my obſervations to turnip-feeding, which, though ſo well underſtood in many places, is by no means much in uſe in Ayrſhire. It is obvious, that as the want of dung for manure is the difficulty which the farmer labours under moſt, who is remote from a town, he muſt have recourſe to ſome expedient to ſupply the deficiency, and there is none better than that of growing turnips, which not only enables him to feed more cattle, but to feed them much better than the old ſyſtem of ſtraw-fodder only, and gives him an infinitely greater command of manure. I ſpeak not only with reſpect to the neceſſary number of milk-cows and young ſtock, but of thoſe alſo which at preſent he is under the neceſſity of ſelling off to the butcher comparatively lean. Turnip would prove of the higheſt importance to moor farmers, who have abundance of excellent land for the purpoſe, and who generally can graze more cattle than they can fodder; and, as it does not ſuffer from froſt early in the ſeaſon, which ſcourges the corn crops on high lands, it might afford a ſure ſupply. Beſides, on the moor edge there is a good deal of black moſſy land: on ſuch land turnip ſucceeds particularly well. If this culture was attended to, we ſhould not ſee flocks of ſheep driven miles to ſave them from abſolute ſtarvation.

Straw-yards.—There is no one thing which would have a greater effect in the improvement of this country than ſtraw-yards. The ſoil of the county of Ayr, particularly in the high lands, is generally a ſtrong clay on various ſubſoils, but frequently on till. As the water, therefore, remains longer on the ſurface of ſuch land, there is a tendency to run to ruſhes. It is palpable that, if the water ſours the ground in furrows, &c. it muſt do ſo in a much greater degree in deep footſteps, yet cattle are every where ſeen ſtruggling up to the *hocks* in mire through gateways and entrances to fields, where they are turned out to wander during the day with ſcarcely a pile of graſs to nibble at. The cattle are not benefited, but the ground is poached; and the conſequence is, that the following year ruſhes uſurp the place of ſweet graſs and white clover. I am convinced it is a miſtake to ſuppoſe that milk-cattle require this expoſure in the fields: I have known many that were not turned out at all, but were cleaned with a blunt currying-comb, and throve extremely well. But, for thoſe who are not eaſily converted from old opinions, the *ſtraw-yard* offers all the benefit of exerciſe for their cattle, without the concomitant miſchief. Let them be turned into the yard in the day time and houſed in the byre at night. Although in this county, as well as elſewhere, there are many farmers who could ill afford the expence of the Eſkmount or Roxburghſhire byre, what I propoſe is within the limits of almoſt every purſe; and though it does not promiſe all the

the advantage of ſuch uſeful buildings, it promiſes a great deal. In many places the farm ſteadings have been built ſo as to form three ſides of a ſquare, and in this area the dung is heaped. In ſuch a caſe, all that is neceſſary, is to find another ſituation for the dunghill, and to complete the ſquare by a ſtone dike three and a half feet high. If uſed for out-byres, a ſtack upon pillars or poſts forms a very good ſhed, or a very cheap one can be run up at the ſide of the barn or byre. The old thatch of ſtacks—ruſhes, which do not rot eaſily without being trod by cattle—ferns, and, in ſhort, a variety of kinds of vegetable matter may be thrown into the yard, and all in the courſe of winter ferments into manure. Where the plan of the buildings does not favour ſo much, a little more ſtone dike will form a ſquare on the moſt ſheltered ſide of the houſes; and ſheds, thatched with broom or heather, will give ſufficient ſhelter. I hope to hear that ſome of your readers have adopted this hint, by their acknowledging to you hereafter the benefit which they have derived. Hoping for pardon for ſo long a letter, I am, Sir, a ſincere wellwiſher to agricultural proſperity,

Ayrſhire, 18th March 1805. PENTAPHYLLON.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Value of Land in different Diſtricts.

SIR,

It is univerſally allowed, that your Magazine has been the medium through which much uſeful knowledge in rural affairs has been circulated; yet there is one very important leſſon hitherto much neglected by your correſpondents, namely, to ſhow the difference in the value of a farm, ariſing from the different ſtates it may be in at the time of entry, or with regard to its ſituation as to climate, markets, &c. &c. And, although the following parallel, drawn betwixt two farms of 240 acres each, both ſituated in the neighbourhood of Wigton, the one of a ſtrong clayey loam, the other one of our beſt turnip ſoils, and other two farms of the like qualities and extent, ſuppoſed to lye in the vicinity of Haddington, may not throw much light on that ſubject, yet it may be the means of turning the attention of ſome of your more enlightened correſpondents that way.

In the firſt place, let it be obſerved, that, on the lands in the vicinity of Wigton, a very few farms only excepted, the houſes are literally worth nothing. Were a proper ſyſtem of farming adopted, farms of the above ſize would require 600l. each, upon an average, to be expended on that article, to put them upon the ſame footing with ſimilar farms ſituated in the neighbourhood of Haddington.

Haddington. Taking this at 7½ *per cent.*, which is the intereſt commonly charged by the proprietors in this county when they allow money for that purpoſe (which, indeed, is ſeldom the caſe), it amounts to 45l. yearly; and if ſuch permanent improvements are not made by the proprietor, as ought always to be the caſe, they muſt be executed by the tenant, which is ſtill worſe.

To begin with the farm of ſtrong clayey loam, let us ſuppoſe it is managed according to what is commonly called the ſix courſe ſhift, viz. 1ſt, Fallow; 2d, Wheat; 3d, Clover; 4th, Oats; 5th, Beans and Potatoes; 6th, Wheat; and that, allowing 24 acres to remain in permanent paſture, there will be 36 acres in each of theſe diviſions. Now, in Eaſt Lothian, farms of this deſcription are, generally ſpeaking, in ſuch a ſituation that a farmer could begin this rotation at the very firſt of his leaſe, whereas ſimilar lands in the vicinity of Wigton are in ſuch a ſtate that it would be ſix or ſeven years before he could have them in that caſe. This may be taken at 1l. per acre yearly of drawback for the firſt three years of a leaſe, 10s. per ditto for the fourth and fifth, and 5s. per ditto for the ſixth year. This makes 102l. of drawback in whole, which, at 10 *per cent.*, makes 10l. yearly. This, I am perſuaded, from what experience I have had that way, will not be too high rated.

Again, it is univerſally allowed, that the climate in Eaſt Lothian is much drier, and every way better adapted both for the cultivation of the ſoil, and alſo for the advancing and bringing to perfection the different corns growing thereon. Now, it is well known to every perſon, in the leaſt acquainted with the management of ſtrong clay ſoils, that it is only whilſt theſe lands are tolerably dry, that they can be ploughed, harrowed, or carted upon; from hence it evidently follows, that the wetter the climate, the more ſtrength both of men and horſes the farmer will require, in order that he may be able to improve the favourable ſeaſon as it comes. The difference in this reſpect, I ſhould ſuppoſe, cannot be taken at leſs than a man and a pair of horſes, or 60l. yearly. Now, again, it is certainly not unreaſonable to ſuppoſe, that lands of this deſcription, in this county, would yield one ſixth part more produce, did they enjoy the Eaſt Lothian climate: this will appear abundantly evident, when it is conſidered what a vaſt difference of produce the ſame field will yield in a good ſeaſon more than in a bad one, (although the field may be equally as well prepared for the ſeed in both ſeaſons, as circumſtances will admit of), amounting often to one half, if not more. Again, in this county, our grain has all to be ſhipped to the Clyde and Engliſh markets; whereas, in Haddington, there is always a ready quick market for the grain in its

its neighbourhood. However, in the following calculation, I will allow our Clyde and Engliſh markets to be as good as the Haddington market; which I much queſtion, eſpecially when it is conſidered that they are often knocked down by the vaſt quantities of grain poured into them from the Iriſh ports.

Firſt, then, let us begin with an acre of wheat. Suppoſe an acre of that grain, upon an average, in this county, will yield thirty Wincheſter buſhels, excluſive of ſeed, and our far-end price to be 7s. 6d. per buſhel, this would make 11l. 5s. per acre. Deduct from this, firſt, *6 per cent.* for the merchant's profit here, which certainly, when intereſt of money, poſtage of letters, and other neceſſary expences are included, may be thought moderate. For freight and port charges, 5d. per buſhel, or $5\frac{1}{2}$ *per cent.* nearly. Inſurance from total loſs at ſea, 1 *per cent.*; for, although the grain is ſeldom totally loſt at ſea, yet it is often much damaged, by being heated and wet; and even if it arrive ſafe at market, it will not ſell ſo high after being ſhipped and unſhipped, as it would do were it taken immediately from the barn to the market. All theſe together cannot be taken at leſs than 6d. per buſhel, or 7 *per cent.* nearly. Now, in Eaſt Lothian, the grain is allowed to be much ſuperior to ours in quality, undoubtedly, in a great meaſure, ariſing from the advantage of climate. This difference I ſhall take at $6\frac{1}{2}$ *per cent.*; add to this 4 *per cent.*, as commiſſion to the grain merchant at the far-end market. Theſe ſums put together will make 30 *per cent.*, or 3l. 7s. 6d. per acre of difference for every acre of wheat. Again, upon an acre of beans, there will be 2l. 5s. of difference, taking the produce to be the ſame per acre, and the Haddington price 4s. 6d. per buſhel, and calculating the ſame way. As to oats, the difference in the market price is not worth mentioning, as there will be little of this article to diſpoſe of, the greateſt part thereof being conſumed by the farm ſervants and horſes: however, the one-ſixth extra produce muſt not be overlooked. Laſtly, I am credibly informed, that lands of this deſcription, in the vicinity of Haddington, are for the moſt part all laid out in moderately broad ſtraight ridges; whereas, in the vicinity of Wigton, they are almoſt all very high, broad, and irregular, running in every direction in the ſame field, and not unfrequently meeting in points in the middle of the field. This impedes the operation of huſbandry very much; and would at leaſt oblige the farmer to have a man and a pair of horſes, over and above what would be requiſite were the lands laid out in a regular way: this, with 10l. additional expences in harveſt, may be reckoned at leaſt at 70l. yearly. But ſome of your correſpondents

ſpondents will be ready to ſay, why be at ſo great an yearly expence?—let the lands be levelled and ſtraighted. This is certainly a very proper advice to a proprietor; but, from what little experience I have in that matter, theſe lands could not be levelled under an expence of at leaſt 50s. per acre; and that only when they were under a ſummer-fallow; ſo that, if a tenant were to attempt it, it would be ſix or ſeven years before he could get over his farm, and, undoubtedly, the ſucceeding crops would be more precarious for ſome years afterwards; and would be a very unprofitable undertaking for a tenant, except he had a very long leaſe indeed. Let us ſee, then, at one view, what theſe ſums will make when put together:

To yearly rent for houſes - -	L. 45	0	0
To the different ſtates of the farm at the time of entry	102	0	0
To extra work ariſing from wetneſs of climate -	60	0	0
To one-ſixth part extra produce per acre, 72 acres wheat will make 432 buſhels, at 7s. 6d. per buſhel -	162	0	0
To one-ſixth part extra produce per acre, 30 acres beans will make 180 do. at 4s. 6d. per do. -	40	10	0
To one-ſixth part extra produce per acre, 36 acres oats will make 288 do. at 3s. per do. - -	43	4	0
To 72 acres of wheat, at 3l. 7s. 6d. per acre, ariſing from difference of market - -	243	0	0
To 30 acres of beans, at 2l. 5s. per acre, ariſing from difference of market - -	67	10	0
To extra work ariſing from the irregularity of the ridges - - -	70	0	0
Total	L. 833	4	0

From this, it would appear that a farm of 240 acres of ſtrong clayey loam in this neighbourhood, if it were in the ſame ſtate at entry, and enjoyed the Haddington climate and market, would be worth 833l. 4s. of yearly rent more than what it is worth in its preſent ſituation, or 3l. 9s. per acre.

Again, in drawing the compariſon betwixt the turnip ſoil farms, I do not ſuppoſe any of our lands of that deſcription are rich enough for the above rotation. I ſhall ſuppoſe they are managed according to what is called the four courſe ſhift, viz. *1ſt*, Turnips; *2d*, Barley; *3d*, Clover; *4th*, Oats; and by allowing 40 acres to remain in permanent paſture, there will be 50 acres in each of theſe diviſions; and, taking the produce of barley and oats to be 40 buſhels per acre, excluſive of ſeed, the table will run as follows:

To

To yearly rent for houſes - - -	L.	45	0	0
To the different ſtates of the farm at the time of entry		80	0	0
To one-fifth part extra produce per acre, { 50 acres barley will make 400 buſhels, at 3s. 6d. per buſhel -		70	0	0
{ 50 acres oats will make 400 do. at 3s. per do. -		60	0	0
To 50 acres barley at 2l. 2s. per acre, ariſing from difference of market - -		105	0	0
To 30 do. oats (the other 20 ſuppoſed to be conſumed at home), at 1l. 16s. per acre, ariſing from difference of market - -		54	0	0
To 50 acres turnips, at 2l. per acre, ariſing from the want of market both for turnips and fat cattle		100	0	0
Total	L.	514	0	0

Hence it appears, that a farm of 240 acres of our beſt turnip ſoil would be worth 514l. of yearly rent more, if it were in the ſame ſtate at entry, and were in the ſame ſituation as to market and climate, &c. or 2l. 2s. 10d. per acre, as the lands of this deſcription in the vicinity of Haddington; and that our clay lands would be as dear at 2l. per acre, as lands of the ſame deſcription would be in the vicinity of Haddington at 5l. 9s. per acre, although apparently of the ſame quality; and our turnip land at 1l. 1s. as dear as theirs of the ſame quality at 3l. 3s. 10d. It would alſo appear that a farmer entering upon a clay farm in the vicinity of Wigton, would require 1020l. (if he had houſes to build at his own expence 1620l.) of capital more than what would be neceſſary upon his entering a farm of the ſame deſcription near Haddington; and upon a turnip farm 800l., and if he had houſes to build 1400l. This undoubtedly leſſens the value of land here, as it may be received as an axiom, that every thing that leſſens the competition among the buyers alſo lowers the price of any article. Strangers, from Eaſt Lothian and other parts, have thought our rents very low; yet it is obvious, that lands are letting as high, if not higher, here, than in any part of Scotland, taking theſe things into conſideration. The generality of farmers in Galloway maintain, with much juſtice, that the lands here pay beſt whilſt they are in paſture (our markets for young cattle of our own breed being as high as any in Scotland); for it appears evident that land which, under the above ſyſtems, would give a fair rent in the vicinity of Haddington, would here barely pay the expence of labour. And although our ſyſtem of farming is apt to be treated with ridicule by ſome of your Eaſt Lothian

farmers who have viſited us; yet, with the exception of a few rich farms here and there, no ſyſtem of aration would enable us to pay ſo much rent upon our light ſoils as we actually do, although no doubt great improvements might be made in our ſyſtem without going to the expenſive ſyſtems adopted by Eaſt Lothian farmers. Here follow the fiar prices of corn for the county of Wigton for crop 1803; and alſo an account of the whole grain bought by one of our principal merchants, from October 1803 to October 1804, with the average prices annexed; all ſhipped in the neighbourhood of Wigton; which, if compared with the Haddington prices for the ſame period, will, I am convinced, fully confirm what I have advanced as to the difference in the market price of grain in theſe two places.

Fiar Prices of Corn &c. for the County of Wigton for Crop 1803, *ſtruck Feb. 14th,* 1804.

	l.	s.	d.
Oat meal per boll of 280 lib. avoirdupois	1	12	0
Farm meal per boll	1	9	4
White corn per boll of 12 Winchester buſhels	1	6	0
Mixed corn per do. of do.	None.		
Grey corn per do. of do.	1	0	0
Beſt per do. of do.	1	10	0
Farm bear per do. of do.	1	8	0
Malt per do. of do.	3	6	0
Barley per do. of do.	1	15	0
Peas and beans per quarter of 8 Winchester buſhels	1	14	0
Wheat per do. of do.	2	0	0

An Account of the whole Grain bought, with the Prices annexed, by a principal Merchant in the Vicinity of Wigton, from October 1803 *to October* 1804.

	Bolls.	l.	s.	d.
White oats per boll of 12 Winchester buſhels	1803	1	3	9⅗
Potato oats per do. of do.	546	1	8	5⅖
Bear or bigg per do. of do.	365	1	5	1
Barley per do. of do.	47	1	7	3⅗
	Qrs.			
Wheat per quarter of 8 Winchester buſhels	418	2	0	4

I ſhall only remark, that there is no ſuch kinds of grain to be found in this county as mixed corn, grey corn, farm bear, or farm meal, although always particularly mentioned in ſtriking the fiar prices, but for what reaſon I do not know. I am, yours, &c.

Wigton, 12th December 1804. A GALLOWAY FARMER.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Thoughts on various Subjects of Rural Economy.

SIR,

I MENTIONED laſt year, Vol. V. p. 196, that I had ſown, in the preceding autumn, about three acres with rape ſeed, as ſpring

ſeed

ſeed for ſheep, and am ſorry to ſay that the crop turned out of little value. The ground had previouſly been in wheat, after potatoes, and was in good condition. I ploughed it about the middle of September, the ſeed was immediately ſown, and the crop was carefully preſerved till the middle of April, when five ſcore of ſheep were put upon it. They only got a ſcanty feeding during three days, when the whole was eaten up; in eight days afterwards they were put upon it again, but the new growth had made ſo little progreſs, that the ſhaken wheat afforded much more benefit than the rape plants; the ſheep were fonder of the former than the latter, and it grew faſter after being eaten down; which confirms an opinion I have long held, that early ſown rye produces more ſpring feed than any crop which we are acquainted with; at the ſame time, I am far from thinking that a benefit will even be derived from it, adequate to the expence of ſeed and labour, independent of the loſs and inconvenience ſuſtained in working the ſubſequent crop. In this northern climate, we are not to expect a ſufficient ſupply of green food, in the ſpring months, for cattle and ſheep, from any crop that has not been well advanced before the autumn; and people muſt be reconciled to beſtow both labour and ground, before ample ſupplies can be furniſhed. The white, red, and green topped turnips can, in moſt ſeaſons, be preſerved till the end of March; and Swediſh turnip, or Ruta Baga, may continue the ſupply ſix weeks longer, by which time rye graſs and clover, if only ſown thick enough, and on well prepared land, will furniſh a full bite of the moſt nouriſhing food. Laying light in ſummer, does not a little add to winter's maintenance, and to a forward bite in ſpring, without leſſening the grazier's profit. Fattening cattle come on but ſlowly when the paſture is kept bare, when compared with their progreſs when a full bite is given; and it is ſurpriſing how much more benefit is derived from graſs before the end of June than in the ſucceeding months.

However beneficial the crops already mentioned may be for keeping ſtock in good condition at all times, yet, under different circumſtances, other articles might be cultivated with equal, if not more advantage, viz. tares, white yams, cabbages, and curled kail; all of which are of eminent advantage to the ſtock farmer. Tares, on all arable farms, are found an excellent article of food, and are of particular uſe when graſs fails, or gets to an age which renders it unfit for being uſed as green food. In high latitudes, and on thin ſoils, tares are ſtill more beneficial, conſidering the little nouriſhment afforded by graſs in ſuch ſituations. In late diſtricts, it is well known that tares admit of a cutting almoſt as ſoon as clover crops; and, as they may be

ſown at different periods, a more regular ſupply of green food may be got from them in the ſummer ſeaſon, than from clover or other artificial graſſes.

In many parts of the country yams are more to be depended upon for ſpring food than turnips; they afford more ſuſtenance from a given quantity of ground, can be houſed and ready at hand for uſe when turnips cannot be brought home, or, at leaſt, when their removal is accompliſhed with much injury to the ground on which they are produced. Cabbages are an excellent article in the end of autumn, or beginning of winter. I have often had my cows ſupported with the under blades for ſeven or eight weeks at theſe periods; and if carefully taken off, no injury, but rather a benefit, will be received. Cabbages will continue, in moſt ſeaſons, freſh and uninjured till the middle of January, and, when ſplit into pieces and boiled among chaff, prove an excellent feed. Green kail, from March to May, are of great ſervice, and yield a weightier crop, on good ſoils, than almoſt any other leguminous root. They will often admit of a ſecond cutting; and a part of the ſtem, ſplit, improves boiled meat for cows very much.

I am well aware, that not a few of your readers will conſider theſe to be but trifling objects; yet be aſſured, that, in the way a conſiderable portion of this county is occupied and farmed, a proper attention to them muſt prove highly beneficial to the generality of our profeſſion. With tares and cabbages in autumn, turnips in winter, yams and green kail in ſpring, and a handful of clover hay, every beaſt reared or kept may be made of double value, and a great increaſe of manure procured. According to our preſent ſyſtem, cattle generally go out in the morning, during the winter and ſpring months, and perambulate the paſtures in ſearch of food, though it rarely happens that they procure as much nouriſhment as would be got from a ſingle pound of hay. It may not, however, be unneceſſary to remark, that the green crops which I have recommended for winter and ſpring conſumption, cannot be raiſed with advantage, unleſs the ground be well cultivated and dunged. I have often found that one acre, ſufficiently dunged, and properly wrought, will produce nearly as many kail, cabbages, yams, or potatoes, as two will do when but half dunged, and ſparingly wrought. In ſhort, it is a waſte of labour, and a miſoccupying of the ground, to graſp at a greater breadth of theſe crops than can be ſubſtantially manured. Indeed, to attempt the raiſing of a greater quantity of any crop, than conſiſtent with the circumſtances under which the farmer is placed, militates againſt every principle

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of good husbandry, and rarely tends to promote the interest of the husbandman.

A few acres in yams, even in the most fertile districts, will prove a more beneficial article in feeding work-horses, especially in the spring months, than what can be produced from the same quantity of ground, if employed in the raising of any other crop. It excites surprise, as well as regret, when travelling the country, to observe so many unproductive fields of new sown grass land; and I am inclined to believe, that this circumstance proceeds, in a great measure, from the scanty quantity of seed used in sowing of such fields. Perhaps a greater quantity of seed, and a better preparation, might, in many cases, render the succeeding crop of grass of double value; at least, I am sure that, if pasture is intended, thick sowing is highly beneficial. No dependence should be placed upon any land seeding itself; though I know some people, who possess soils on which white clover may be considered as naturalized, are apt to hold this circumstance in view when the artificial grasses are deposited. A full quantity of rye grass and rib grass should also be sown, as they are not expensive, and thrive better on new lands than other grasses. A general prejudice seems to be entertained against rye grass, particularly against sowing it thick, on account of the supposed injury done thereby to clover; but I never found, in the course of my experience, any bad consequences from giving the ground a much greater quantity than what is generally bestowed. Perennial rye grass springs early, continues to grow long in the autumn, and stands frost better than any other grass.

Your correspondent, *Arator junior*, Vol. V. p. 425. seems desirous of withholding the usual allowance of seed given to ground, but I suspect that very bad consequences would follow the general adoption of his sentiment. His observations with respect to the careless manner in which seed work is generally executed, are much better founded; because, where one part of the ground is sown too thick, and another too thin, a considerable loss must necessarily be sustained; yet, till we arrive at greater perfection in the art of sowing, or contrive some mode by which the seed will be deposited at equal depths, a full allowance of seed must be required in the broad-cast way, if a full crop is expected, unless the ground be in a very superior state of cultivation. I remember, many years ago, when the practice of sowing grass seeds was in its infancy, Quaker Miller, a first-rate seed merchant, and a very sagacious man, when applied to by his customers, with regard to the quantity of seed they ought to give to an acre, never failed to tell them, that if they sowed sparingly they would reap sparingly; an aphorism which no

farmer ſhould loſe ſight of. A boll of oats to the acre, is too little ſeed for the land of this country in general, and ſo is three firlots of barley. Laſt harveſt, from four acres ſown with forty pecks of potatoe oats, I reaped ſomething leſs than forty bolls, whereas five acres of the ſame field, ſown with ſix bolls of *Church's oats*, produced ſixty bolls. The firſt was evidently too thin; and not a doubt could be entertained, but that if more ſeed had been ſown, the produce would have been conſiderably increaſed. Indeed, ſo far as has come under my obſervation, every attempt to ſave ſeed, like thoſe made to ſave labour, is ultimately attended with a degree of loſs in direct proportion to the length it is carried.

We have heard a good deal of what has been gained in England from a ſaving of ſeed from drilling and dibbling. Some years ago I travelled through that country, and narrowly examined the crops on a pretty wide circuit, immediately before the the harveſt ſeaſon, and in general found the wheats remarkably thin, eſpecially in the counties of Suffolk and Eſſex, where drilling and dibbling of wheat prevailed. The bean crops were the reverſe, pretty tall, and the ground cloſe covered in. They ſeemed to be commonly drilled from twelve to fifteen inches aſunder, and not very fruitful; which laſt circumſtance I aſcribed to the plants being deprived of ſun and air, two requiſites abſolutely neceſſary for rendering a crop productive. One great advantage that beans drilled have over thoſe broad-caſt is, that as moſt of the fruit or grain is ſtationed near the under part of the ſtem, the influence of the atmoſphere is obtained by means of the intervals. This is not neceſſary with wheat, barley, or oats, the grain of which plants, being ſituated at the top of the ſtalk, will thrive and come to maturity, even though the ground is fully covered. I have always found that a few ſtems of theſe grains, when ſtanding by themſelves, never arrive at the ſame degree of perfection or productiveneſs, as when a greater number ſtand in a more compact poſition. This is not the caſe with beans, for a ſtalk is never more productive than when ſtanding by itſelf. I am, with beſt wiſhes for the ſucceſs of your work, Sir, your obedient ſervant,

Mid Lothian, 20th Dec. 1804. T. S. S.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter, accompanying Extracts from Fourcroy on the Philoſophy of Vegetation.

SIR,

1. IN agriculture, as in all arts and ſciences, there are a ſeries of principles upon which a right intelligence of the numerous obſervable facts may be rationally explained; and which, connecting theſe facts into a regular ſyſtem, forcibly impreſs them on the memory. This ſeries of principles may very properly be called the theory of the art or ſcience. As in mechanics, all principles depend upon mathematics; ſo in agriculture, the principles upon which plants are nouriſhed, depend altogether on chemiſtry; which, in its modern highly improved ſtate, leads, with almoſt poſitive certainty, to a knowledge of the nature of ſoils, and their amelioration in various ways; and the effects of manures, ſo as to facilitate the growth of vegetables, and to increaſe the quantity of their uſeful productions.

2. Until ſome perſon, properly qualified by intimate knowledge of chemiſtry, and great agricultural experience, ſhall favour the world with a ſyſtem of the principles of agriculture, or its theory; I have, to ſerve my brethren in the mean time, extracted from the ſyſtem of chemical knowledge of the celebrated Fourcroy of Paris, what may very properly be conſidered as an abſtract or epitome of all that is at preſent known to ſcience, reſpecting the theory or philoſophy of agriculture. To this I have given the name of *philoſophy of vegetation*.

3. As the ſubject in his book forms part of a general ſyſtem of chemiſtry, I have not confined myſelf ſtrictly to his arrangement; having varied that, to ſuit it for the purpoſe now meant. Indeed, being a ſubject purely chemical, it is not to be underſtood properly, without ſome previous knowledge of the language and principles of modern chemiſtry; an abſtract of which would treſpaſs too much on the bounds of the Farmer's Magazine. Yet it ſeems abſolutely neceſſary to premiſe a ſlight view of ſome part of the chemical doctrines, to render the ſubject at all intelligible.

4. Except for this introductory matter, it is to be noticed that I am only accountable for fidelity of verſion; and therefore do not hold myſelf bound, in any degree, to enter into controverſy on the ſubject. The chemical principles, upon which the whole facts and reaſonings are grounded, will, I am convinced, be found perfectly conſonant with thoſe now univerſally adopted by philoſophers. A great number of chemical terms will neceſſarily occur in the ſeries of this communication. Theſe muſt be attended with

with unavoidable inconveniency and difficulty to many readers; but every ſcience or art muſt of courſe ſpeak its own appropriate language.

5. All matter, as a ſubject of human knowledge, is generally arranged under three grand diviſions, Mineral, Vegetable, and Animal, which have been termed the three kingdoms in the empire of nature. To theſe may be added, Heat, as the univerſal vivifying principle; and the Atmoſphere, which is equally neceſſary to life, both animal and vegetable.

6. The nature and origin of heat are unknown, though many of its effects are familiar to all. Heat, as it increaſes in bodies, univerſally augments their bulk. Heat applied to many ſolid ſubſtances, moſt likely to all, in ſufficient intenſity, and in proper circumſtances, firſt renders them liquid; and, by ſtill farther addition, reduces them to vapour. In theſe two alterations of the ſtate or condition of matter, it has been decidedly proved, that a very conſiderable portion of the cauſe or matter of heat, now named caloric, enters into compoſition with the matters ſo acted upon, forming part of the newly produced ſubſtance, and without increaſing farther its warmth or temperature. Thus all liquified ſolids, conſiſt of the original ſolid combined with one doſe of caloric, ſo long as the temperature is ſufficiently high; and all aëriform gaſes, produced from ſolids or liquids, conſiſt of the original ſolid or liquid matters, combined with a ſtill larger doſe of caloric. Hence, by analogy, it is preſumed, that all liquids and aëriform fluids or gaſes whatever, conſiſt of ſome originally ſolid matter combined with caloric; and that if caloric could be ſufficiently abſtracted, theſe would all be reducible to ſolids. Light certainly acts a very material part, along with heat, reſpecting the chemical changes which ſubſtances undergo; but it would lead to too vaſt and intricate a field of diſcuſſion, to attempt here to explain its nature and operation. Some notices on this ſubject will occur in the ſequel.

7. Upon theſe principles, the atmoſphere, or the air we breathe, muſt be compoſed of ſome naturally ſolid portion or portions, combined with caloric, and inſeparable from it, in any degree of known, or even conceivable cold. Accordingly, we find that air, in many natural operations and artificial proceſſes, actually combines with ſolid or liquid matters, ſo as to form an efficient part of them, even greatly augmenting their weight; and in a degree of compreſſion hardly conceivable; unleſs upon the foregoing principles, of air conſiſting of a ſolid baſis, rendered aëriformly elaſtic by combination with caloric. And we find, in every inſtance where the air enters into ſuch ſolid or liquid combinations with other bodies, a great quantity of its combined caloric

caloric is ſet free, ſo as to produce warmth or temperature. Whenever that combination is ſufficiently rapid, the temperature of the ſubſtance, with which the air is entering into combination, is ſo highly increaſed as to be ignited, and combuſtion or inflammation is produced. In fact, combuſtion is nothing more than the actual and rapid combination of one part of the air with the burning body. The ſmoke produced during combuſtion, proceeds from part of the burning body being raiſed into viſible vapour by the high temperature; and the flame is occaſioned by the ignition or burning of that ſmoke, entering likewiſe into rapid combination with the air, and giving out caloric and light.

8. Though the atmoſphere, or the air we breathe, ſeems one homogeneous fluid, it is yet certainly compoſed of two very different gaſes, only mixed together, not chemically combined. One of theſe, in largeſt quantity, named azotic gas, is by itſelf incapable of ſupporting flame; and if animals breathe in it, they inſtantly die. The other, named oxygen gas, ſupports flame much more intenſely than atmoſpheric air; is capable by itſelf of ſupporting animal life, by breathing for a longer time, in the ſame quantity, than atmoſpheric air; and enters into a vaſt number of combinations with various bodies, either by obvious or inſenſible combuſtion. The atmoſphere likewiſe contains a ſmall portion of carbonic acid gas, to be afterwards noticed; and ſmall portions of every evaporable ſubſtance, with a large portion of aqueous vapour, diffuſed, or in ſolution.

9. Water likewiſe, though apparently a homogeneous ſimple liquid, is actually a compound body, conſiſting of oxygen, or the ſolid baſis of oxygen gas, combined chemically with hydrogen, which is the ſolid baſis of another gas, long known by the name of inflammable air.

10. The combination of hydrogen with azot, or the ſolid baſis of azotic gas, forms ammonia, or what is commonly called volatile alkali.

11. There are a number of combuſtible bodies, which, by combination with oxygen, are changed into acids. Thus, ſulphur combined with oxygen forms ſulphuric acid, formerly called oil of vitriol. Phoſphorus, by the ſame combination, is changed into phoſphoric acid. Charcoal, or rather its pure baſis or element, named carbon, by the ſame combination, forms carbonic acid, which, in its ſtate of gas, that is, farther combined with caloric, forms carbonic acid gas, formerly called fixed air. Azot, in combination with oxygen, forms nitric acid. Beſides theſe enumerated combuſtible bodies, there are a great number of metals; all of which, in one way or other, are ſuſceptible of entering into combination with oxygen, by a proceſs

ſimilar

ſimilar to combuſtion; either in ſufficient quantity to be changed into real acids, or in a ſmaller doſe, by which they are changed into oxyds.

12. Hydrogen gas is capable of diſſolving a portion of carbon, by which carbonated hydrogen gas is formed. By diſſolving a portion of ſulphur, ſulphurated hydrogen gas is formed; and, by diſſolving a portion of phoſphorus, phoſphorated hydrogen gas.

13. Beſides the above mentioned acids, there are a number of others, either found naturally in vegetables, or produced by fermentation, or by artificial chemical means, the baſes of which are found to conſiſt of compounds in various proportions of carbon and hydrogen, acidified or changed into acids, by farther combination with oxygen, the univerſal acidifier.

14. Beſides the acid ſtate of combination with oxygen, all the acidifiable baſes above mentioned are found ſuſceptible, both ſingly, and compounded in various proportions, of entering into combination with oxygen in a doſe leſs than is neceſſary to convert them into acids. In this ſtate they are termed oxyds. Theſe are found, generally ſpeaking, to conſtitute the elements of vegetable ſubſtances in a natural or growing ſtate; which conſiſt for the moſt part of hydro-carbonous oxyds, varioufly compounded, and modified by their organic ſtructure. In ſome of theſe, azot enters into the compoſition, and various other matters to be hereafter mentioned.

15. From all plants may be extracted a peculiar ſaline ſubſtance, called vegetable fixed alkali, which modern chemiſtry denominates by the ſingle word *potas*. Potaſhes are compoſed of this, combined partly with carbonic acid, forming a neutral ſalt called carbonate of potas, together with a mixture of ſome carbon or charcoal, and ſuch earthy matters as may have exiſted in the original plant; and ſome minute portion of metals, ſuch as iron and manganeſe, which likewiſe exiſted in the original ſubſtance of the plant. Some plants, chiefly ſuch as grow on the ſea-ſhore and ſalt marſhes, and ſea-weed, produce a portion of another ſalt, formerly called mineral fixed alkali, now *ſoda*, combined partly with carbonic acid, into carbonate of ſoda, and mixed with ſimilar foreign ſubſtances.

16. In the native juices of plants, theſe two alkalis are ſometimes found combined with other vegetable acids, forming neutral ſalts of various names and natures, which need not be here enumerated.

17. The ground upon which plants grow, and from whence they derive their chief nouriſhment, by means of their roots, is a heterogeneous maſs or aſſemblage of various earthy matters, ſtones,

ſtones, ſand and gravel, penetrated by water, and mixed with the decayed and decaying parts of dead animals and vegetables, and ſome metallic oxyds, and containing a variety of the before enumerated compound oxyds, combuſtible or acidifiable bodies, and neutral ſalts. Hence may readily be ſeen how the earth ſhould ſupply nouriſhment to plants, from the decay of which it has acquired the elements or principles of that nouriſhment.

18. In the ground upon which plants grow, beſides the mixture of decayed and decaying animal and vegetable bodies juſt mentioned, chemiſtry detects the three following ſimple earths, as forming the chief maſs of its ſubſtance: 1. Alumine, or the pure earth of clay: 2. Silex, or the pure earth of flint and ſand: 3. Calx, or the pure earth of lime. A fourth, magneſia, is found in ſome abundance, but not nearly in ſuch quantity as theſe; and a fifth, barytes, is ſometimes found in earth and ſtones.

19. Were theſe earths all pure in ſoils, however compounded among themſelves, the ground, or the ſoil in which plants grow, would always be uniformly white, like pure ſand, or pulverized quartz. But theſe earths are uſually leſs or more contaminated with metals, or their oxyds, and mixed with the carbonaceous remains of decayed vegetables, from which laſt the black or dark colour of ſoils is principally occaſioned; as their red and yellow tinges are chiefly produced by oxyd of iron, in different ſtates of oxydation or combination with carbonic acid.

20. Of theſe earths, magneſia, alumine, calx, magneſia, and barytes, are ſuſceptible of entering into combination with carbonic acid, forming carbonats, ſoluble leſs or more in water, and thus capable of being abſorbed by the roots of plants. Vinegar likewiſe, which is found in the decaying vegetable ſubſtances, may ſerve to the ſame end, forming acetites. The metallic oxyds, likewiſe, are either themſelves ſoluble to a certain degree in water, or become ſo by combination with carbonic acid. Even ſilex is either ſoluble in an immenſe proportion of water, or becomes ſo by combining with a portion of either of the alkalis. Carbon, and its combination with hydrogen, and the oxyds or acids of the other combuſtibles, azot, ſulphur, and phoſphorus, are all leſs or more ſoluble in water. Thus we ſee how the water which percolates the ſoil, and is abſorbed by the roots of plants, muſt form a heterogeneous ſolution of an immenſe variety of articles, and, by abſorption through their roots, furniſh plants with every thing neceſſary for their nouriſhment. Many of theſe may even be diffuſed in water, in ſuch minute ſubdiviſions, as to be ſuſceptible of entering the capillary abſorbent veſſels of the roots of plants. Thus vegetation,

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and the decay of vegetables and animals, form a perpetually moving circle of life produced by diſſolution, and deſtruction producing life; a conſtantly active chemical elaboratory, in which the decay of organized bodies decompounds the ſubſtances of former organization; which new organization ſucks up into itſelf, and recompounds into the neceſſary juices and ſolids, for preſerving its own life, and producing its growth and increaſe.

21. Animal ſubſtance, which is moſtly produced by the organization of the living animals, operating ſimilar decompoſition of vegetable ſubſtance, and ſubſequent recompoſition, into a ſomewhat different ſeries of compounds, but compoſed of the ſame ultimate elements, contributes likewiſe, by its decay, to the formation of that heterogeneous maſs mixed with the ſoil, termed *mould*; of which hereafter.

22. I do not think it neceſſary or proper to enter, in this place, upon any inveſtigation of the different kinds of ſoils as they occur on land, which would render this introductory eſſay much too prolix and complicated. Theſe chiefly depend upon the proportions of clay, lime, and ſand, or ſtones of various kinds in their compoſition; and on the quantity and quality of mould mixed with them; on their depth, and on the nature of their ſubſoils. I hope I have, as diſtinctly as is conſiſtent with brevity, and as fully as the limits would admit, explained the chemical principles in general, and thoſe connected with ſoils and vegetable ſubſtance, ſo as ſufficiently to render intelligible what I propoſe to tranſlate from Fourcroy, in which three chemical principles will be farther developed as we proceed.

23. Were I to have tranſlated the whole articles in the ſyſtem of Fourcroy, which tend directly or indirectly to the ſubject, I ſhould have furniſhed a large volume. All I mean, is to ſelect what are beſt calculated to throw light upon the ſcientific principles of vegetation; and in ſuch an arrangement, as ſeems beſt calculated for that end. What follows is from Fourcroy, except a few notes occaſionally ſubjoined to the text.

Berwickſhire. R. r. r.

NOTE BY THE CONDUCTOR.

We are in duty bound to expreſs the great obligations we are under to the ingenious and reſpectable gentleman who has ſo kindly favoured us with the above communication, and the accompanying extracts from Fourcroy on the Philoſophy of Vegetation. Theſe, added to former favours, entitle him to our utmoſt gratitude. Such a correſpondent, indeed, is a tower of ſtrength to our work; and we will at all times be proud to receive his intereſting and inſtructive communications. N.

FOURCROY

FOURCROY ON THE PHILOSOPHY OF VEGETATION.

PART I.

Of the Putrid Fermentation of Vegetables.

1. PUTREFACTION is the laſt ſpecies of fermentation which vegetable ſubſtances undergo, and which operates their intire decompoſition. No part of vegetables is exempted from this proceſs; yet almoſt all may be preſerved from it, by depriving them of water, and of the acceſs of air and heat. Some ancient chemiſts, particularly Beccher, formed a kind of compariſon between the proceſſes of putrefaction and combuſtion. This obſervation was certainly well founded, though not ſuſceptible of direct proof in thoſe days, and has been fully confirmed by the diſcoveries of modern chemiſtry.

2. Several circumſtances are requiſite to admit of putrefaction in vegetable ſubſtances. Their ſtructure requires to be ſoftened by means of water. All vegetable matters, in a ſtate of dryneſs, preſerve without change; whereas all that are ſufficiently moiſt, corrupt even the hardeſt woods, the drieſt ropes, and the firmeſt coriaceous ſtems. The contact of air contributes greatly to the commencement and continuance of the proceſs of corruption. A number of inſtances may be produced of flowers and fruits preſerved freſh and healthy in vacuo, and in places well defended from all acceſs of air. It is not neceſſary for the putrefaction of vegetables that they be kept in a high temperature. From 50° to 60° of Fahrenheit is quite ſufficient; yet a higher temperature, inſtead of injuring, haſtens the proceſs, providing that it be not ſufficient to dry them thoroughly. The ſtate of dryneſs produced by means of an oven, is the moſt completely antiſeptic proceſs known for vegetables. The proceſs of ſpontaneous putrefaction is ſingularly encouraged by gathering vegetable ſubſtances into heaps, which, however, muſt not be compreſſed, at leaſt not forcibly.

4. All the conditions requiſite for promoting putrefaction being united, this decompoſition ſhows itſelf by alteration of colour and conſiſtency in the various vegetable matters; their ſtructure becomes weaker, and ſoftens; their layers and fibres are raiſed and ſeparated from each other; their ſoft and liquid parts ſwell up, and become covered with froth. Elaſtic fluids or gaſes pervade them in all parts, blow them up, tear them aſunder, and eſcape. Their temperature augments conſiderably, and ſometimes even produces inflammation. The diſengaged gaſes at firſt have a ſlightly unpleaſant odour, but become afterwards muſty, diſagreeable, fœtid, and ſlightly ammoniacal: Theſe are principally compoſed of carbonated hydrogen, carbonic acid, and azotic gaſes. Theſe recited phenomena diminiſh gradually, after continuing longer

longer or ſhorter, according to the conſiſtence or texture of the vegetable ſubſtances, which loſe a conſiderable portion of their bulk in conſequence of the extrication of the gaſes, and likewiſe by evaporation. When completed, there remains a reſidue, more or leſs abundant, of a blackiſh colour, containing only the more fixed materials which exiſted in the original compoſition of the vegetables, namely, the earths, the acids with which theſe are ſaturated, and part of the carbon of the vegetables.

4. In the circumſtances neceſſary for the putreſcence of vegetable ſubſtances in its phenomena, and in its products, both volatile and fixed, we readily diſcover the influence of numerous chemical attractions, which the materials or elements, entering into their original ſtructure or compoſition, exert mutually upon each other. The hydrogen unites with oxygen, and either eſcapes in form of water reduced to vapour by the heat, or in hydrogen gas uncombined with oxygen, carrying off part of the carbon in ſolution, forming carbonated hydrogen gas; while another part of the hydrogen combines with azot in ſuch vegetables as contain that ſubſtance, forming ammonia; a farther part of the hydrogen remains in the ſolid reſiduum, to which it communicates colour, and occaſions its remaining odour. The original carbon unites partly with the diſengaged hydrogen as already noticed, or unites with oxygen by a ſpecies of imperceptible combuſtion, and flies off in carbonic acid gas, while a portion remains in the reſiduum. The oxygen ſeparates in compoſition with one or other of theſe two above mentioned materials, forming binary compounds.

5. Among the fixed reſidues left by the putrid decompoſition of vegetables, we chiefly notice, as objects of utility, hemp, flax, or other ſimilar remains of watered fibrous plants analogous, rotten wood, muck, and mould.

§ I.—*Of ſteeping Hemp, Flax, &c.*

6. The effects produced by ſucceſſive action of water and air upon the fibres, originally glued together, of hemp, flax, broom, and other ſimilar plants having ſemiligneous ſtems, containing numerous fibres, is well known. They are ſteeped in water for ſome days, below the ſurface of which they are held down by means of ſtones. The mucous gluten and extractive matter, which held their fibres together, is diſſolved and decompoſed; the bark ſeparates from the internal woody ſtructure, of which the various layers and its fibres become eaſily ſeparable. This operation of watering is in ſome places named *retting*; probably a corruption for rotting.

7. By experience, running water is found preferable for this proceſs to ſtagnant, although moſt country people entertain the contrary

contrary prejudice. Inſtead of ſteeping in cold water, according to the ordinary proceſs, the effect may readily be produced by boiling in water with a ſmall addition of alkali. In the ordinary method, the ſteeping is accompanied by an inſupportable fetor, and a real putrid decompoſition. For which reaſon, I have here introduced this proceſs, as producing a kind of fibrous ſkeleton, ſeparated by putrid decompoſition from the other matters which ſurrounded theſe fibres in their natural ſtate. This decompoſition muſt be ſtopped in proper time; as it would otherwiſe attack the fibrous texture, and render it weak and brittle.

8. From theſe ſolid yet flexible fibres, thus ſeparated, are manufactured thoſe delicate light ſtuffs, unknown to the ancients, of which modern poliſhed nations form the veſtment worn next their ſkins. Linen, it is well known, poſſeſſes conſiderable ſtrength and durability: Yet, by cutting it in pieces, and grinding it to pulp, after having been macerated and partly putrefied * in water, it is formed into a paſte, which, diluted and ſuſpended in warm water, is moſt ingeniouſly formed into ſheets of paper, by means of fine wire ſieves. After drying, theſe ſheets are covered with a vegetable or animal glue, to admit of being written upon, without the ink ſinking or ſpreading.

§ II.—*Of Rotten Wood.*

9. Dead trees, corrupted in different ways, and called rotten wood, or *touch-wood*, is one of the moſt ſingular reſults of the putrid decompoſition of vegetables. The footſtalks of leaves, the woody ſupports of flowers and fruits, the ſmall ſpray, the ſlight ſtems of ſhrubs and dried graſs or herbs, changed ſomewhat into the nature of wood by drying; when collected on the ground, and heaped up along with fallen leaves upon moſſes, in hollow places where water collects; leſs or more covered or penetrated by the water, and having contact of air, ſpoil, decay, and decompoſe: They become brown or black, dividing or ſplitting off their cortical ſubſtance, in thin layers or filaments, and leave below a yellowiſh, browniſh, or whitiſh ſoft texture, without conſiſtency, having an odour of mouldineſs, and in a ſtate of decompoſition named rotten, or touch-wood. †

10. When expoſed to damp air, or in low ſituations, where

* This partial putrefaction of rags, previouſly to their being made into paper, is not now practiſed by Britiſh paper-makers.—*R. r. r.*

† A ſimilar ſpecies of decompoſition takes place in dunghills, when too dry and open. Inſtead of falling down into good, well rotted muck, they remain dry, whitiſh, and mouldy, or become what is uſually termed fire-fanged.—*R. r. r.*

the water cannot freely evaporate, blocks of ſolid timber, joiſts or planks, after ſome years, undergo this change. Hence, wooden fences in thick foreſts, and in cloſe, unventilated court-yards; ſhelves and other wooden articles in cellars; benches, and timber partitions in ground-floor rooms; and in ſhort, in every place where the air wants free circulation and is conſtantly loaded with humidity, become ſoft, ſplit open, give out a mouldy ſmell, loſe their ſolidity, and finally divide into white layers or filaments; which are pliable when damp, and pulverulent when dry.

11. Though all the phenomena which ſucceſſively occur, during this ſpontaneous decompoſition and deſtruction of timber, have neither been obſerved nor deſcribed with ſufficient care, ſtill ſome of them have been attended to, which are proper to be noticed in this place. It is known, that during the whole courſe of this proceſs, and almoſt to the end, the decompoſing timber is phoſphoreſcent, or ſufficiently luminous to produce a ſingular appearance in the dark. In this ſtate, it always exhales an odour ſimilar to the agarics and boleti, or puff-balls; which ſeem often to owe their production to the conſequence of this decompoſition of wood. It is known that various of the immediate materials or elements of vegetable ſubſtance, as the mucous, extractive, feculent, and oily matters, are gradually deſtroyed, and eſcape from the woody matter during this decompoſition: That theſe are either entirely loſt, or, if recovered afterwards, are in a very changed ſituation, not much attended to as yet, but which merits to be carefully examined.

12. When the laſt reſiduum of rotten wood is examined, beſides loſing its ſolidity and conſiſtence, it has loſt the greater portion of its original ſubſtance, and its ligneous property, and the greater part of its weight. Its combuſtibility is greatly diminiſhed; it burns weakly and ſlowly; gives out very little heat, and leaves very few aſhes: But theſe aſhes are remarkably ſaline; and ſeveral chemiſts have obſerved, that ſulphat of ſoda is found in them more abundantly than is uſually procured from vegetable ſubſtances. What has been hitherto diſcovered on this ſubject, ſhows that a careful inveſtigation of all the changes that take place in theſe ſpontaneous decompoſitions, may lead to important concluſions in the philoſophy of vegetation.

§ III.—*Of Muck.* *

13. Though, at firſt ſight, there may not ſeem in the ſlow decompoſition

* I have choſen this word, both to diſtinguiſh it from dung, the excrement of animals, and for the reaſons aſſigned in the text.—*R. r.*

decompoſition of herbaceous ſtalks and ſtraw of graminaceous plants, any thing eſſentially differing from that of ſolid, vegetable matters; yet the ſpecies of phenomena which theſe preſent, and the product which they afford under the name of *muck*, ſo important an object in agriculture, require ſome peculiar notice. I am not, however, to be underſtood, here, of that complex mixture of animal and vegetable materials called muck by agriculturiſts; that collection of materials of every kind which they heap together, along with the ſtraw which has ſerved as litter to animals, and which, impregnated with their dung and urine, furniſhes a manure ſo fertilizing to their grounds.

14. In this place, I confine myſelf merely to the remains of the ſtraw or ſtalks of all kinds of plants, which, moiſtened in ſuch manner as to admit the air to ſurround and penetrate them, heat, become coloured, divide, and exhale a fetid ſmell; giving out aqueous vapour, charged with carbonated hydrogen gas, and ſometimes a ſmall quantity of ammonia, which ſoften, melt down partly into a brown, ſtrong ſmelling liquid, highly conducive to vegetation, and which depoſits charcoal by gradual precipitation: Which finally reſolves its remanent ſolid part into a blackiſh, friable maſs, that at laſt becomes pulverulent, and is confounded with the earth, into which it gradually changes, from this ſtate of *mould* or vegetable earth; which we ſhall ſoon examine.

15. During this decompoſition, which renders theſe vegetable remains ſo ſerviceable for ameliorating, enriching, and manuring land, into which it is mixed by means of the plough, the original elements compoſing theſe vegetable ſubſtances react mutually upon each other: by means of a gradual fermentation, or imperceptible inteſtine movement, they unite again into a new order of compoſition from what ſubſiſted among them in the perfect vegetables. Part of theſe original ultimate elements, in their new order of compoſition, eſcape in vapour; part diſſolve into a thick liquid, named *muck-water*; part retain the ſolid form, after loſing the greater part of their texture and organization. All theſe elements, more ſimply combined than in the compounded form in which they exiſted formerly, tend gradually to reſtore to the atmoſphere and the ſoil, what had been borrowed from theſe during the living proceſſes of vegetation. And from this very decompoſition it is that muck ſerves ſo uſeful a purpoſe as manure, in ſupporting and encouraging vegetation, as will appear in the ſequel.

§ IV.—*Of Mould.*

16. The laſt ſtep in the ſlow putreſcent decompoſition of thoſe herbaceous ſtalks and ſtraws, the final ſtate of the muck which they produce, in which ſtate it is ſaid to be conſumed, is its reſolution into *mould*, or vegetable earth. The blackiſh viſcid pulverulent maſs, into which muck finally reſolves after its complete decompoſition, is ſo named, on account of its reſemblance to earth in form and appearance; and becauſe it thus adds layers to the ground, apparently augmenting its bulk and depth. This mould may, in ſome degree, be conſidered as an aſſemblage of the woody ſkeletons of the herbaceous ſtalks: But it muſt not, as formerly, be conſidered as only compoſed of the fixed materials or elements of which theſe ſtalks were originally formed.

17. The name formerly given to this ſubſtance, vegetable earth, only thus expreſſes its external appearance or phyſical properties. It muſt not be confounded with earth, ſtrictly ſo called; ſince earthy ſubſtances generally conſtitute only the ſmaller portion of materials of which mould is compoſed. The firſt analyſis of this ſubſtance, made ſeveral years ago by Giobert and Haſſenfratz, have proved it to contain oily matters, extractive ſubſtances, and charcoal containing a conſiderable quantity of hydrogen. Submitted to diſtillation, mould gives out liquids and elaſtic gaſes, both of which have conſiderable odour. Boiled in water, it communicates colour, taſte, and ſmell to that fluid. Heated with contact of air, it takes fire, and even ſometimes burns with conſiderable rapidity. By more attentive analyſis, recent mould gives acetites and benzoats of potas, lime, and ammonia, ſulphats and muriats of potas, and a ſpecies of ſoapy ſubſtance, mentioned by Bergman. It muſt, however, be obſerved, that by careful waſhing, ſome organized remnants of the original ſtalks may ſtill be detected.

18. Among its fixed materials are found a conſiderable quantity of charcoal in a minutely divided ſtate; ſome carbonat of lime, phoſphat of lime, ſilex, alumine, magneſia, iron, and manganeſe. Sometimes ſilex is very abundant; for it may readily be conceived, that mould muſt differ in the proportions and elements of its fixed reſiduum, according to the nature of the plants from which it has been produced. We are aſſured, that in mould there are always found ſome ſmall cryſtals of quartz, perfectly regular and tranſparent; and this is by no means repugnant to the numerous examples of the ſolution and reception of ſilex into the organs of plants and animals.

19. One of the lateſt diſcoveries reſpecting mould, which diſtinctly proves the combuſtibility and highly compound nature of this

this ſubſtance, is its great power of abſorbing the oxygen of the atmoſphere, ſo as to leave only its azotic gas. Ingenhouſz, who made the diſcovery, and Humboldt, who has confirmed and extended it by repeated experiments, conſider this abſorption as ſufficiently preciſe to conſtitute mould a proper eudiometrical inſtrument. It will be ſeen in the ſequel, that this remarkable property throws great light upon the phenomena of vegetation, as affected by the ſoil and by manures.

20. When we reflect on the concatenation and economy of the phenomena of nature, we readily perceive that the formation of mould, this neceſſary conſequence of the ſucceſſive deſtruction of dead vegetables, is the great and ſimple proceſs, whereby nature perpetually furniſhes the nouriſhment of new vegetation. That to this is owing the nature of the ſoils of all woody places, and is the ſource of their inexhauſtible fertility, as it perpetually ſupplies the ſame original materials for the continuance of vegetative nouriſhment. Hence, art has learnt to imitate the fertility of nature, to aſſiſt the production of thoſe vegetables required by human induſtry; ſo as to prevent the ſame ground from becoming quickly impoveriſhed and exhauſted, which it muſt be unqueſtionably, without this conſtant recruit.

§ V.—*Of Foſſile Wood.*

21. Though this ſubſtance is treated of by Fourcroy, under a ſeparate article, entitled, 'The ſlow decompoſition, and various changes which vegetables undergo under ground;' yet, as foſſile wood and peat ſeem much connected with the ſubſtances treated of in this preſent diviſion, it appeared proper to introduce them here. In the original article, petrified vegetables are introduced: but theſe, having no proper connexion with our ſubject, are here omitted.

22. Wood is often found buried under the earth, at from thirty to fifty feet below the ſurface; more eſpecially along the banks of ſtreams and rivers. In this ſtate it is readily aſcertainable to be wood, not only by its form, texture, and conſiſtency, but even by the large collection of trunks and branches heaped together in a confuſed maſs. Seldom are excavations made upon the ſides of rivers, or under their beds, without diſcovering this timber; ſometimes in ſuch quantities, as to be evidently entire trees, even parts of foreſts, buried by ſome great convulſion of nature,—ſuch as are ſometimes ſeen even in our days. Theſe ſtill more frequently occur near the large rivers of vaſt uninhabited continents; whoſe banks have carried, during a long ſucceſſion of ages, the produce of ancient vegetation, by which the ſoil is entirely covered and ſaturated.

23. Thus buried deep in the earth, or in water, without acceſs of air, vegetable ſubſtances undergo certain natural proceſſes of decompoſition, differing from thoſe already deſcribed. Having neither contact of air, nor, for the moſt part, ſufficient temperature for the fermentative proceſſes, they are not ſubject to the vinous, acetous, or putreſcent fermentations. Penetrated every where by water, which never quits them, or which carries along with it into their ſubſtance, ſaline acid earth, metallic or other particles, or modified in various other ways, they are effected by new cauſes and modifications during their deſtruction, which change their natures and appearances; and which, though they ſtill preſerve ſome part of their original compoſition, give them a very different ſtate and condition from what they poſſeſſed originally.

24. Theſe foſſile woods are uſually of a brown colour, or almoſt black, and of a ſoft tender conſiſtence when firſt uncovered. But when expoſed ſome time to the air, they harden quickly, and very conſiderably, preſerving their dark colour, and acquiring a much finer and cloſer grain and texture, than the ſame wood in its natural ſtate of timber. This foſſile wood is often very advantageouſly employed for ſome erections, particularly for ſuch as are to be expoſed to damp air, in low rooms, cellars, and ſuch places,—as it is unchangeable by the humidity of the atmoſphere. Foſſile wood is ſtill highly combuſtible, giving out little flame or ſmoke, but abundance of heat. When extinguiſhed, after being half burnt, its charcoal is denſe and heavy. In diſtillation, it gives over a fetid oil, which is almoſt ſolid.

25. In all theſe enumerated properties, we obſerve a woody ſubſtance, not of its original nature, which has undergone certain changes in its compoſition. The layers of wood, penetrated by water, have loſt part of their mucous, extractive, and other ſoluble matters. They are leſs or more reduced to the ſtate of pure woody ſkeletons. Part even of the external ſurface of their ligneous fibres is decompoſed, and reduced to the form and colour of charcoal. Part of their hydrogen has been carried off. In proportion as the water, which impregnates and ſeparates the layers, is diſſipated, perhaps by the incumbent preſſure, the layers approach together with force. Hence, the hardneſs, cloſe grain, and brilliant ſurface, which foſſile woods acquire, when cut and poliſhed. Hence, the little ſmoke and flame which they give out in burning. Hence, though ſtill ligneous, they tend towards entire decompoſition; and a ſtill longer continuance in their underground ſituation, would at length deſtroy them completely, by gradually diminiſhing their properties as vegetable ſubſtance.

Hence,

Hence, foſſile woods are ſometimes found quite friable, which never recover conſiſtency or hardneſs; and which may be bruiſed down into a ſpecies of mould.

§ VI.—*Of Turf or Peat.*

26. In a ſimilar manner, plants of various kinds, not woody, are gradually reduced to a carbonaceous ſkeleton, by being buried under moiſt earth, or by the filtration of water. There are many low-lying meadows, only equal with, or even below the ſurface of ſmall brooks and rivulets; which are ſucceſſively covered over with water, and again left partially dry; but through which water always percolates every where. Theſe ſwamps or meadows nouriſh an enormous quantity of plants, crowded together, continually growing, and, by their annual decay, forming ſucceſſive layers of their dead remains; by which the ſoil becomes covered to greater or leſs depths, according to circumſtances, with theſe vegetable remains, or the interwoven ſtems of herbaceous vegetables, of a black carbonaceous colour, and a diſagreeable and even fetid odour, which announce a conſiderably advanced ſtate of vegetable decompoſition.

27. This interwoven contexture of vegetable remains, ſtill ſomewhat ſolid, and retaining the combuſtible quality, is known under the name of peat; * and the places from whence theſe are procured, are called peat-moſſes. † Although peat is compoſed of an interwoven aſſemblage of ſtalks, originally thicker, and preſſed together into a kind of ſolid conſiſtency, yet, by careful ſeparation of the fibres, ſeveral of the plants which have contributed to its formation may be recogniſed. It can be ſeparated into long ſoft ſtems, uſually brown or black, ſometimes violet or blue, which no longer retain the conſiſtency of the original plants, and which are evidently altered in their texture and nature.

28. When peat is heated in diſtilling veſſels, it gives over a yellow or reddiſh fetid liquor, extremely fetid oil, carbonat of ammonia, and highly fetid carbonated hydrogen gas. There remains a charcoal, which is often pyrophorous; and from which, after being burnt to aſhes, ſeveral ſalts may be extracted. Theſe are chiefly muriats, and ſulphats of ſoda and potaſs, mixed with phoſphat of lime, ſulphat of lime, and oxyds of iron and manganeſe. All

* I prefer this term to that of turf; which latter is frequently uſed for the matted roots of recent vegetables on the ſurface, otherwiſe called *ſod*.—*R. r. r.*

† In French, *tourbières*, from *tourbe* a peat. Were it neceſſary, we might ſay peatery, as coalery is employed to denote the place whence coals are taken.—*R. r. r.*

the world is acquainted with the manner in which peat burns in grates and furnaces, the bad ſmell which it emits, and the reddiſh ferruginous aſhes which it leaves. It has been attempted, with ſome ſucceſs, to deprive it of theſe inconveniences, by half-burning it in cloſe veſſels, ſo as to char it in the manner of wood. The proceſs is certainly attended with advantages; but this ſpecies of charcoal is very inferior for moſt purpoſes to the charcoal of wood, and liable to take fire ſpontaneouſly, by the combined action of water and air, on which account it muſt be kept for uſe in well covered places. I had occaſion to ſee in Paris, a yard filled with charred peat, exceedingly well prepared, forming an immenſe pile, expoſed to the air. After ſome days of rain, to which, of courſe, it was completely expoſed, it began to exhale great quantities of white ſmoke, which ſoon changed to flame, and conſumed the whole maſs, threatening to produce a more extenſive deſtruction, by communicating the fire to the neighbouring combuſtibles.

29. Peat, therefore, is an aſſemblage of plants partially decompounded, half burnt as it may be called, and reduced almoſt to a carbonaceous ſtate, analogous in its nature to foſſile wood, which is likewiſe partially charred. It is employed for fuel in places where no other can be procured, and may be very advantageouſly uſed in that way in many manufacturing proceſſes, where very great heats are not required. Its aſhes is employed for manure; and, by lixiviation, ſome ſalts may be extracted from them that are uſeful in the arts.

30. In ſome peat moſſes, the peat is found to be impregnated with ſulphuret of iron or pyrites. This ſubſtance is ſo highly combuſtible, when expoſed to moiſt air, that ſuch peat, in its uncharred ſtate, becomes much heated when expoſed to the air, and even ſometimes takes fire. In ſome of theſe, particularly in the neighbourhood of Beauvais, the ſulphuret of iron is ſo abundant, that ſulphat of iron may advantageouſly be extracted from them by lixiviation in the ſame manner as from pyrites. It is likewiſe probable that a thick oil, analogous to tar, may be extracted from moſt kinds of peat by diſtillation, as was propoſed by Beecher in the year 1683.

31. * Upon attentive conſideration of the preceding account of foſſile wood, and eſpecially peat, it is obvious that they conſiſt of vegetable ſubſtances, partially decompoſed, and tending towards the ſubſtances already noticed under the names of muck and mould. Conſequently, by properly facilitating their farther decompoſition, theſe,

* This ſhort ſection, only, is added by the tranſlator; for which he muſt crave indulgence.—*R. r. r.*

theſe, more eſpecially peat, may be moſt advantageouſly employed to augment our ſtores of manure or vegetative nouriſhment. Accordingly this has already been ſucceſsfully attempted by a learned Judge of the Supreme Court at Edinburgh, by ſtratification of peat with raw muck. Upon the ſame principles may eaſily be explained the fertilization of peat moſſes, after laying their ſurfaces ſufficiently dry, and facilitating its farther decompoſition into mould by the addition of quicklime or muck, or both. *R. r. r.*

(To be continued.)

[The following Papers are communicated by SIR JOHN SINCLAIR, Bart. who, at all times is warmly diſpoſed to promote the deſign of this Work, and to diſſeminate information upon every branch of rural economy. Their author, the late LORD DAER, a young Nobleman of diſtinguiſhed abilities, was much intereſted in every object which could render benefit to mankind, and a keen friend to the improvement of his native country. They were wrote at Paris in June 1791, and contain intrinſic evidence of the attention ſhown by his Lordſhip to the ſubject therein inveſtigated. While we, as in duty bound, are led to pay this mark of reſpect to his Lordſhip's memory, it cannot be improper to obſerve, that few of his contemporaries were better qualified to benefit the public, though, unfortunately, this illuſtrious character entered upon active life at a period when political animoſities occaſioned the moſt valuable qualities to be altogether loſt ſight of.]

Letter from Lord Daer to Sir John Sinclair, Baronet, dated Paris, 29th June 1791.

DEAR SIR,

I SAW Mr Brouſſonet and Mr d'Aubenton, as you wiſhed, about the fine woolled ſheep of the Spaniſh breed. I have noted a few obſervations on the ſubject which I ſhall ſhew you, though probably unimportant. I may juſt now obſerve, that the latter, on accurately comparing in my preſence the wools, was convinced, as I and all preſent were, that the fineſt Shetland you ſent over is not near ſo fine as his. I believe he once ſaid the contrary to you.

You ſay to me, 'it would be very deſireable to have as many of the Spaniſh breed from France as poſſible, and inquire how they may be obtained.'

I was ſorry, therefore, you had not aſked Brouſſonet for more; for at the time the fifteen were ſent, you might as eaſily have got thirty, and no favour done. D'Aubenton's flock allows him

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to diſpoſe yearly of from ſixty to a hundred, rather more of which are rams than ewes; which he declares are all, as near as poſſible, equally fine. From the terrible embarraſſments formerly attending improvements of agriculture in this kingdom, he uſed to get little value for them, except to the butcher, at about twelve livres per head. Of late years, a greater demand, for the ſake of improving the wool, has ariſen; and he now gets forty-five livres, and next year may perhaps get forty-eight livres a head. Brouſſonet however expects, from the rapid progreſs agriculture promiſes under the new free conſtitution, and the great number of ſpeculative gentlemen and farmers which the Revolution has already produced, that in a few years theſe ſheep may ſell for ſix or eight louis a head.

The object of my now writing, is to ſubmit to your conſideration, whether it might not be adviſeable to endeavour to make a contract with D'Aubenton for all, or at leaſt half, of what he ſells, for ſome years, at a fixed price, ſay two, or even three guineas a head. I ſpeak of the price at his farm in Burgundy: If he would contract to deliver them at Rouen or Dieppe, ſo much the better. If you either can authoriſe this to be done for the Society, or would recommend it to me, and get ſome active, attentive perſons to join with me as a private concern, I will try whether D'Aubenton will come to any agreement. I do not know, but I think he probably will.

Direct to me *aux ſoins de Meſſrs Perregaux banquiers à Paris.* I hope you can anſwer me directly, as my ſtay in Paris may be ſhort. I am, dear Sir, your moſt obedient humble ſervant,

DAER.

Subſtance of a Converſation between Lord Daer and M. Brouſſonet, reſpecting Spaniſh Sheep and Wool, at Paris, on 4th June 1791.

There are no publications of any conſequence on the ſubject of ſheep and wool, excepting ſome ſcattered memoirs, which M. Brouſſonet had ſent to Sir John Sinclair.

There are a variety of breeds in Spain; but two of them only are diſtinguiſhed for the excellence of their wool. The firſt are ſtationary, and remain all the year round in the neighbourhood of the Pyrenees. They are long bodied, low, rather ill ſhaped, with ſmall horns, which generally fall out. Some of them were got into France about thirty or forty years ago; but being put on poor land, they rather decreaſed in ſize. 'Tis this breed only that can eaſily be procured in France, as the Spaniſh ſhepherds are often obliged to hire paſtures in that kingdom for their flocks. Thoſe in Rouſſillon are much the ſame, and nearly as fine. The other breed is the travelling

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one. They are ſmall, very ſhort bodied, long legged, with large twiſted horns, wool hanging over their face, &c. This is the breed which M. D'Aubenton has. It is not difficult to ſmuggle even them; but they are often not of the fineſt ſort.

The propagation of Spaniſh ſheep in France has been much impeded by reſtraints; in particular, by the regulation, that all the ſheep in the pariſh muſt paſture in common, under the management of the ſame ſhepherd. One gentleman had got a flock of one or two hundred; and though he willingly paid the common ſhepherd, yet he was proſecuted, and fined three years ſucceſſively, for deviating from the law, and, in diſguſt, ſold his flock to the butcher. M. D'Aubenton can only have a flock of from two to three hundred. For many years, he had no demand for his ſpare ſheep, and ſold them to the butcher, even fine rams, at twelve livres, or ten ſhillings a piece. The demand is now greater, and the price forty livres, or thirty-four ſhillings each, for rams and ewes. Since the Revolution, agriculture has been more attended to and encouraged; and it is ſuppoſed that the price will riſe to five or ſix louis. M. le Blanc in Champaigne got his breed moſtly from M. D'Aubenton, and manages his flocks in the ſame manner. He ſells his rams at forty ſhillings a piece.

They get over Engliſh wool cheaper ſince the late acts, and as many Engliſh ſheep as they pleaſe. The expence of bringing them into France is only a guinea a head. A friend of M. Brouſſonet's is now getting two hundred from England and two hundred from Spain. Four times croſſing the breed with a Spaniſh ram, gives wool as fine as the original. It is thought that open ſheds, as a ſhelter againſt rain, is an advantage. It is imagined that a hot climate is of ſervice. The wool is then more oily, which is reckoned uſeful. M. D'Aubenton's breed more oily than the long bodied. The Engliſh wool is dry, even the Hereford, which is the beſt in England, and approaches to the Spaniſh. The Shetland wool remarkably fine, but not equal to the Spaniſh, nor ſo well calculated for making cloth. It does not ſpring out forcibly when compreſſed, as the Spaniſh does, and is not ſo much twiſted or crimped. This crimping in clothing wool cannot be too minute. The Spaniſh wool is not above an inch, or an inch and a half long. M. D'Aubenton has ſent fifteen of his beſt flock to Sir John Sinclair, and will ſend a ſcore more if applied to. The wool, on a good ram may weigh four pounds. The Spaniards divide their wool into five ſorts, and ſeparate it, previous to clipping, by opening lines through the wool as it grows on the body, before they apply the ſhears. It is ſuppoſed that the fineſt breed of ſheep is

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in the internal parts of Africa, inland from Tunis and Algiers. A man ſent there to buy horſes for the King, brought over two or three finer than the Spaniſh, and ſaid to have more wool; but they are now extinct in France.

[Several of our Correſpondents having requeſted us to inſert the 'Rules and Regulations of the Morayſhire Farmers' Fund for the benefit of widows, orphans, and decayed members,' in compliance with their requeſt we give the principal ones, ſo as that farmers in other diſtricts may be benefited from their proceedings. At the ſame time we muſt add, that the annual payments appear to us as rather highly calculated; and we believe that the Morayſhire Club have it in contemplation to reduce them. More on this ſubject afterwards. At this time it is only neceſſary to ſay, that the inſtitution is laudable, and deſerves to be ſupported.]

Propoſed Rules and Regulations of the Morayſhire Farmers' Fund.

THE Morayſhire Farmer Club being deſirous of eſtabliſhing a proviſionary fund for the benefit of widows, orphans, and decayed members, under ſanction of the act of Parliament 21ſt June 1793, entituled, 'An act for encouragement and relief of the Friendly Societies,' named a committee of their number to prepare a ſcheme for that purpoſe. Their committee collected every information in their power regarding ſimilar inſtitutions, held various meetings and conferences, and conſulted with William Morgan Eſq. of the Equitable Aſſurance Office, London, an eminent calculator, on the buſineſs; and having procured from Mr Morgan a table of rates applicable to the views of the Club, the following Scheme and Regulations are now laid before the public, in the view of eſtabliſhing ſuch fund, viz.

1. That in order to carry the ſcheme into effect, it is neceſſary that there ſhall be one hundred ſubſcribers at the leaſt; and, in caſe that number is procured, they propoſe that the fund be entituled, 'The Morayſhire Farmers' Fund for providing annuities to widows, decayed members and orphans;' and that the fund ſhall be open for admiſſion to every man of good character and ſound health in the ſituations after deſcribed, who ſhall be willing to conform to the following regulations.'

2. That no perſon whoſe age exceeds fifty-five years, or whoſe age exceeds that of his wife twenty years, can be received or admitted a member.

3. That all members after the Society is formed, by the junction of 100 members, ſhall be admitted by ballot at a general meeting of the Society; and that no perſon ſhall be admitted, unleſs

unleſs two thirds of the members preſent ballot for him; and until the number ſhall amount to one hundred, the candidates are to be balloted for in the manner above directed by the members of the Morayſhire Farmer Club, who have or may become ſubſcribers.

4. That there ſhall be five claſſes of annuities of 10l. 15l. 20l. 25l. and 30l. each; and that the married ſubſcribers are to pay annually the rates effeiring to the reſpective annuities made choice of by them, agreeably to their reſpective ages, and the ages of their wives at the period of their admiſſion, as ſpecified in the annexed table; and that bachelors and widowers, while they remain ſuch, ſhall only pay two thirds of the yearly rates ſo payable by married men ſpecified in the ſaid table: But in caſe of their marriage, they are, within three months thereafter, to pay up the full rates of the annual payments of their reſpective claſſes for the period they have been ſubſcribers, if, previous to their marriage, they have not contributed to the fund as much money as is equivalent to ſeven years rates, and intereſt thereof at five per cent. per annum, paid by married ſubſcribers in ſimilar claſſes; and thereafter they are to continue to pay as married men.

5. That the fund ſhall not be opened for payment of annuities, until ſeven years after its commencement; and that every member, his widow or orphans, muſt have contributed ſeven years to the fund, before being entitled to any benefit therefrom.

6. That in caſe of a decayed member, i. e. a member reduced in his circumſtances by innocent misfortunes, ſickneſs, or old age, claiming the benefit of the fund; it is provided that ſuch a perſon muſt have contributed to the fund at leaſt fifteen years, and that he muſt inſtruct, on oath, annually, that his income, gains, or earnings on which his ſubſiſtence depends, do not exceed yearly 20l., if he is of the claſſes of 30l. or 25l.; do not exceed 15l., if he is of the claſſes of 20l. or 15l.; and do not exceed 10l. a year, if of the 10l. claſs; in which event, he is to receive and be entitled to demand a ſimilar annuity with a widow of the claſs to which he belongs: But in the event of ſuch decayed member leaving at his death a widow or orphans, they ſhall only be entitled to one half of the annuity belonging to his claſs, unleſs ſhe or they ſhall pay up the ſums with intereſt which the ſaid decayed member may have received previous to his death: And it is hereby declared that no decayed member ſhall be entitled to give his vote at any meetings of the Society while he is a penſioner on their funds.

7. That the widows (after contribution by their huſbands in manner aforeſaid) ſhall be entitled, during their widowhood, to the annual rate provided to the claſſes to which they reſpectively belong,

belong, during their lives. But in caſe of the marriage of any widow, her annuity ſhall ceaſe as at the laſt term before her marriage. But if ſhe ſhall again become a widow, ſhe ſhall then be entitled to the benefit of the fund for the remaining years of her life and widowhood; and while ſhe remains a widow ſhe ſhall at all times make known her place of abode to the collector; and every widow ſhall, previous to the receiving her annuity, produce to the collector a certificate ſigned by herſelf, and atteſted under the hands of the miniſter of the pariſh in which ſhe reſides, or of the neareſt Magiſtrate, if the pariſh church is vacant, that ſhe ſtill remains the widow of the deceaſed member.

8. That the orphan or orphans of any member ſhall be entitled (after contribution in manner aforeſaid) to receive annually, equally among them, the rate provided to the claſs to which they belong, until they, or he, arrive at 17 years of age.

9. That if at any time it ſhall appear to the Society, that their funds will not be ſufficient to pay the claims of annuitants, and expence of management, then the truſtees ſhall be empowered to direct a call to be made upon the ſeveral members of the Society, in proportion to their claſſes and rates, for making good ſuch deficiency, provided the call in any one year does not exceed one third of his rate; and any member refuſing to anſwer ſuch call, ſhall be excluded from the fund, and forfeit all his payments to the benefit of the Society.

10. That if, in proceſs of time, it ſhall appear to the Society, that it has acquired a capital more than ſufficient to uphold its credit, as well as to ſatisfy all claims to which it may be liable, it ſhall then be competent for the Society to increaſe the allowance to the annuitants.

11. That as the annuities hereby provided are alimentary; it is declared that ſuch annuities and proviſions ſhall not be affectable by, nor ſubject to, the debts or deeds of the annuitants, or the diligence of their creditors by arreſtment or otherwiſe, in any manner of way.

12. That no widow, decayed member, or orphans, entitled to benefit from the Society, ſhall at any time ſell or otherwiſe diſpoſe of their annuity, or any part thereof: That no ſum or ſums of money ſhall or will be paid by the collector, but to ſuch widow, decayed member, or the legal guardian of orphans, whoſe receipts alone ſhall be accepted by the collector for payment thereof; and in caſe it ſhall be diſcovered that any of them has, directly or indirectly, ſold or parted with his or her intereſt in the fund as aforeſaid, then, upon ſatisfactory proof thereof, ſuch annuity ſhall immediately ceaſe, and neither ſuch annuitants, or any perſon or perſons on their account, ſhall have any further claim or demand on the Society.

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14. That all ſubſcribers ſhall be bound to keep and obſerve all the articles, clauſes, proviſions, and ſtipulations, herein ſpecified, together with all after agreements, rules, and by-laws, that have or ſhall, from time to time, be made at the annual general meetings, with the concurrence of at leaſt two thirds of the meeting, for the benefit of and better conducting the inſtitution; provided ſuch by-laws and regulations are made conformably to the act of Parliament before ſpecified.

15. That the funds of the Society ſhall be under the immediate direction and management of 12 ordinary truſtees, to be choſen by ballot at a general meeting of ſubſcribers, to be called and held at Elgin, ſo ſoon as one hundred members have acceded to the ſcheme: And it being indiſpenſably requiſite, that thoſe who are to be intruſted with the direction of the Society's affairs, ſhall have it in their power to attend to the deſpatch of buſineſs, with as little inconvenience to themſelves as poſſible, the forementioned 12 ordinary truſtees, ſhall be elected by ballot from among the ſubſcribers whoſe reſidence is in the town of Elgin, or within 12 miles thereof: But declaring, that the powers of the ordinary truſtees ſhall extend no farther than to the watching over the improvement of the Society's funds; but on no account are they to be entitled to alter in any particular, or deviate from, the fundamental principles eſtabliſhed in theſe articles, and table of rates therein referred to.

16. That, for the better conducting the Society's affairs, there ſhall alſo be choſen at the ſaid meeting, a collector, with ſuch ſalary as ſhall appear ſuitable at the time; he always, upon being elected, and before entering upon office, giving bond to the truſtees, with ſufficient ſureties, to the extent of L. Sterling, for the faithful diſcharge of his office, which ſhall be effectual to levy and make good the annual and other rates payable by the ſubſcribers, to pay the annuitants, and others entitled to receive money from the fund, and to ware and beſtow the ſurplus monies, upon proper ſecurity, for the intereſt of the Society, under the direction of the truſtees.

18. That there ſhall alſo be choſen, at ſaid meeting, a clerk to the Society, for the purpoſes of attending all general meetings of the Society, as alſo the meetings of the truſtees through the year, whoſe duty it ſhall be to record all reſolutions, tranſactions, and by-laws of the Society, in a book or books to be kept for that purpoſe, and to write cards or letters to the members, &c.; and he ſhall alſo receive ſuch ſalary as may be thought ſuitable, and find caution for the faithful diſcharge of his office, under the penalty of L. Sterling.

19. That the truſtees ſo to be choſen, ſhall continue to act until

until the firſt Wedneſday of June after their election, upon which day, between the hours of twelve and two o'clock afternoon, a general meeting of the Society ſhall be held at Elgin, and the like meeting ſhall be held upon the firſt Wedneſday of June, betwixt the hours of twelve and two o'clock afternoon, yearly thereafter, at which general meeting to be called as ſaid is, and at all after general meetings, three of the truſtees before mentioned firſt upon the liſt, ſhall be removed, and other three truſtees choſen by ballot in their place, from among the ſubſcribers, whoſe reſidence is in the town of Elgin, or within twelve miles thereof as aforeſaid; and theſe three, with the other nine truſtees, ſhall have the management of the funds during the year enſuing; and, in caſe any perſon choſen as an ordinary truſtee for the year, either at the firſt, or any after general meeting of the ſubſcribers, ſhall happen to be abſent, and afterwards decline to act, the remainder of the truſtees for that year ſhall be entitled to chooſe another in his place; as alſo, in caſe any of the ſaid twelve ordinary truſtees ſhall happen to die during the year, the ſurvivors of the truſtees, or their quorum, ſhall be entitled to chooſe another in the place of thoſe that may deceaſe.

21. That beſides the general annual meeting above mentioned, an extra general meeting may be called at any time on the joint requeſt of five ſubſcribers, the motives alleged by them for calling ſuch meeting being previouſly communicated to and approved of by a majority of the 12 ordinary truſtees convened for that purpoſe.

23. That the truſtees to be choſen as above, ſhall meet for the ordinary management of the affairs of the ſociety, quarterly, upon the firſt Wedneſday of February, May, Auguſt, and November, between the hours of twelve and two o'clock afternoon, or ſuch other hour as ſhall be found moſt ſuitable to the truſtees for the time, in ſuch place in the ſaid town of Elgin as ſhall be provided for that purpoſe, either by the truſtees or collector, as ſhall afterwards be found moſt adviſeable; the collector having always power to convene the truſtees oftener through the year as the Society's affairs may require, which he ſhall be empowered to do by a written notice left at their houſes five days before the meeting; and ſuch of the truſtees as fail to attend theſe, or the quarterly meetings before mentioned, ſhall be liable in a fine of 2s. 6d.

27. That the collector ſo choſen ſhall be convener for the truſtees, ſhall always be preſent at their meetings to aſſiſt them with his advice, and to furniſh them with any information they may have occaſion for. But the collector ſhall have no vote in the management along with the truſtees, unleſs where it ſhall ſo

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happen that the truſtees at any meeting ſhall be equally divided upon any queſtion under deliberation; in that caſe, the collector ſhall have a caſting vote.

28. That the collector ſhall, annually, make up and report to the truſtees a ſtate of the Society's funds, with its receipts and diſburſements, to be laid before the annual meeting at leaſt ſix days previous to ſaid meeting; which ſtate, together with the books of the Society, ſhall be open at all times to the inſpection of the ſubſcribers or members of the Society.

30. That when any perſon ſubſcribes to the fund, he ſhall produce to the collector an authentic extract from the pariſh records, or other ſatisfactory evidence of his age, and, if he is married, of his wife's age alſo.

31. That all payments to the fund ſhall be made in advance, that is, the annual contributions for the year enſuing ſhall be conſidered as payable at the term of Candlemas yearly; and ſuch contributions ſhall bear intereſt at the rate of 5 *per cent. per annum*, after the term of payment, till paid.

32. That all married and unmarried members of the Society ſhall give the earlieſt notice in writing to the collector, of any change in their ſituation, as no widow will be entitled to her annuity, unleſs an information of her marriage ſhall have been lodged by her huſband, with the collector, ſix months at leaſt before ſhe becomes a widow; or unleſs her marriage can be proved in a ſatisfactory manner, to have been regularly and fairly entered into.—But this rule ſhall not apply to ſubſcribers who report themſelves married at ſubſcribing, and is only introduced to prevent colluſive and death-bed marriages, or any other ſimilar impoſitions that may be attempted upon the Society.—And it is hereby declared, that a marriage entered into by any member of the Society while on death-bed, or while he is in a bad ſtate of health, labouring under the diſeaſe of which he dies, ſhall be conſidered as a colluſive marriage, entered into with the fraudulent intention of creating a burden on the fund; and the widow, in ſuch caſes, ſhall not be entitled to an annuity.

33. That no widow whoſe huſband, or orphans whoſe father ſhall die before the expiry of ſeven full years from the term at which his annual ſubſcription commenced, and before he has made ſeven complete years payment to the claſs he has choſen or ſubſcribed to as aforeſaid, ſhall be entitled to the benefit of the fund; but if his widow or other repreſentatives chooſe to pay up the ſaid ſeven years annual rates, his widow or orphans ſhall be entitled to the benefit of ſaid fund.

34. That where a ſubſcriber ſhall be in arrear to the fund, and dies leaving a widow or orphans, they ſhall reap no benefit

until theſe arrears be paid, and their annuities ſhall only commence from the time ſuch arrears are paid up.

35. That widows' penſions ſhall be paid annually, without any deduction whatever, and ſhall commence and be payable at the firſt term of Whitſunday that ſhall happen ſix months after the deceaſe of her huſband.

36. That the annuity payable to orphans as above, ſhall become due at the firſt term of Whitſunday that happens ſix months immediately following the death of the father; which, in the event of the contributions being fully paid up in manner foreſaid, ſhall alſo be paid to them without any deduction.

38. That as circumſtances may occur, in which a man may chooſe to provide more amply for his widow and children than the limited advantages of one individual claſs can afford, it ſhall be permitted to any perſon to ſubſcribe to two or more claſſes as he may find convenient.

39. That as the very exiſtence of the fund, from the nature of the calculations it is eſtabliſhed upon, depends on the punctuality of the payments of the ſubſcribers, and on the certain and ſpeedy improvement of all money due to it, every ſubſcriber who ſhall not pay his annual contributions, ſhall be ſubject to immediate proſecution for ſuch contributions in arrear, with an additional ſum of two ſhillings per pound, beſides the full expences of proſecution.

40. That as it is evidently the intereſt of every bachelor to enter early into this ſcheme, there ſhall be no objection made to the youth of the ſubſcribers.

42. That if any member of this Society ſhall fail to pay his contributions, with the intereſt thereof, and forfeiture of 2s. per pound for two years after the ſame become due, he ſhall be excluded, and alſo forfeit all his preceding payments.

45. That none of the preceding rules, orders or regulations, ſhall be altered, reſcinded or repealed, unleſs with the conſent and approbation of at leaſt four fifths of the members of the Society, aſſembled at two annual general meetings to be called for the purpoſe.

46. That all the preceding rules, orders and regulations, ſhall, as ſoon as the ſame are ſanctioned and confirmed at the Quarter Seſſion of the Peace for the county of Elgin, or an adjourned meeting thereof, be forthwith entered in a ſederunt book of the Society, and be ſubſcribed as ſoon as poſſible by all the members of the Society; and all members to be afterwards admitted, ſhall alſo ſubſcribe the ſame at their admiſſion, by which they ſhall be ſtrictly bound to all the rules, articles, and regulations therein contained.

TABLE

TABLE REFERRED TO,

Shewing the annual premiums (the firſt to be made at the time of ſubſcribing) for ſecuring an annuity of 10l. to the widow of the ſubſcriber after the firſt ſeven years, or to himſelf, if diſtreſſed, after the firſt fifteen years, or to ſuch orphans as ſhall ſurvive him till the youngeſt attain the age of 17 years. Theſe payments to be continued annually during the life of the member, or until he ſhall be incapacitated by illneſs or diſtreſs.

EQUAL AGES.	ANNUAL PREMIUM.			Additional ſum to be paid for each year which the age of the huſband exceeds that of the wife.		
	£.	s.	d.	£.	s.	d.
25 & under.	2	5	0	0	0	8
26	2	5	6	0	0	8
27	2	6	0	0	0	9
28	2	6	8	0	0	10
29	2	7	6	0	0	11
30	2	8	6	0	1	0
31	2	9	6	0	1	0
32	2	10	8	0	1	0
33	2	11	10	0	1	0
34	2	14	0	0	1	0
35	2	15	4	0	1	0
36	2	16	8	0	1	0
37	2	18	2	0	1	1
38	2	19	10	0	1	2
39	3	1	6	0	1	3
40	3	3	0	0	1	4
41	3	5	0	0	1	5
42	3	7	0	0	1	6
43	3	10	0	0	1	7
44	3	12	0	0	1	8
45	3	14	0	0	1	9
46	3	14	0	0	1	9
47	3	14	0	0	1	10
48	3	13	0	0	1	10
49	3	11	6	0	1	11
50	3	10	0	0	2	0
51	3	8	0	0	2	1
52	3	6	6	0	2	2
53	3	5	0	0	2	3
54	3	4	0	0	2	4
55	3	3	0	0	2	6

N. B.—To ſhew the annual rates payable by thoſe intending to ſubſcribe to the 15l. claſs, they have only to mutiply the above by 1½; for the 20l. claſs, by 2; for the 25l. claſs, by 2½; and for the 30l. claſs, by 3.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

SIR,

I am extremely sorry to occupy so much of your valuable Work with a discussion which can only be interesting to a few of your readers; and I fear has now become tiresome to all. I was always confident, that if Sir George Mackenzie and I had only the good fortune to understand each other, we would agree. From his letter, p. 192., I perceive we are not far from a cordial agreement; and after offering a single remark on his Note, p. 26., I shall take the liberty of making such observations on his letter as, I hope, may have the effect of bringing us to a thorough understanding, and of ending the discussion.

In p. 26., Sir George expresses his surprise there should be no remainder, and that I did not lose *one atom*; when it is evident, from the very nature of my process (whether right or wrong I shall submit to Sir George's own decision), it was not possible there could be any remainder or *atom* lost in the calculation. He also says—'*Fine clay* and *sand* are expressions inadmissible in a chemical process; and in his essay, I am pretty sure, Mr Headrick will not use them.' Had my object been the ultimate analysis, or the resolution of limestones into the proportions of primitive earths they contained, I certainly would not have used such terms. I know as well as Sir George, that neither clay nor sand (quartz) are simple bodies, the first being a compound of alumina and silica; the latter of silica, with a very minute proportion of alumina, and occasionally of other substances. My object being to find, not the primitive earths, but the substances, as they exist *in rerum natura*, combined with limestone, I apprehend *fine clay* to be a very proper expression, as it denotes the unctuosity and greasy feeling of that substance, when separated from sand or quartz.

With regard to decomposing bodies into their primitive earths, I have tried several processes for that purpose, on stones in which none but the most usual earths, or metallic oxyds, occur. I might proceed to detail some of these processes, which, though perhaps not better, differ in several respects from that adopted by Sir George. But as neither the number, nor specific differences of the primitive earths, are yet settled by chemists, I really do not see any practical advantage agriculture is likely to derive from a detail of such processes; or from any controversy concerning their accuracy or defects.

I shall pass over the first paragraph of Sir George's letter, with remarking, that I do not see how I have *virtually* acknowledged the validity of his objections to A. S.'s processes. Nor did I intend

tend to offer any *apology* or *vindication* of that gentleman, because I did not conceive he needed any, as his paper appeared to me correct, as far as it goes. I had no communication with him on the subject, and presumed, if he needed vindication, he was well able to vindicate himself.

With regard to the insinuation of my misrepresenting Sir George's former communications, I am not conscious of having wilfully done so. The papers are before the public, whom I leave to judge of the validity of the charge; and Sir George was not entitled to bring such an accusation against me, unless he had condescended on the specific instances in which I had misrepresented his communications. The remainder of this paragraph I confess I do not understand.

In his second paragraph, Sir George finds fault with my process, as discovering only the quantity of *carbonate*, and not the quantity of *pure* lime, which a farmer carries home.

In answer to this, it may be observed, that lime is seldom so completely burnt as to have all its carbonic acid expelled from it. In general, the farmer 'carries home' more or less of carbonate of lime; and the reduction of the mass to its lightest state, by the expulsion of all the evaporable ingredients, is seldom effected.

Though I stated that some limestones discovered a deficiency of carbonic acid, even by their mode of effervescence; yet these extreme cases are rare: and those limestones which contain a proportion of bitumen or carbon, though they may vary a little, discover no sensible variation in their proportions of carbonic acid combined with the proportions of pure lime they contain.

If, then, we were furnished with a medium standard of the usual proportion of carbonic acid, and water of composition, in carbonate of lime; having ascertained the proportion of refuse, we might easily calculate the proportion of pure lime in the mass, without any sensible error.

'Sir George should observe, that though Bergman and Kirwan differ considerably in the proportions of carbonic acid contained in carbonate of lime, they both agree in stating the evaporable matter at 45 parts in a 100; and Dr Thomson only differs from them in making the evaporable matter 5 *per cent.* more.

Suppose, then, we assume 45 to be the medium proportion of evaporable matter in carbonate of lime, and 10 as the proportion of refuse in a stone, the contents of the stone will be as follows:

Refuse	10
Carbonic acid and water	40½
Lime	49½
	100

And if we take Dr Thomſon's ſtandard of 50 as the proportion of acid and water, the contents of the ſtone will be,

Refuſe	10
Carbonic acid and water	45
Lime	45
	100

Perhaps the true ſtandard may be the medium between theſe two; and thus, having found the proportion of refuſe, the carbonate of lime is given, and the proportion of pure lime in the maſs may be deduced by a very eaſy calculation. Whether the ſtandard be correct or not, calculating by one ſtandard will, at leaſt, enable us to form a comparative eſtimate of the quantity of lime in different ſpecies of limeſtones.

In the proceſs I attempted to deſcribe, the lime may be precipitated from ſolution in the form of carbonate, and, being waſhed, may be burnt into pure lime in a platinum cup or crucible, and its amount aſcertained by weighing. But in all ſuch operations, there is uniformly ſuch a loſs as muſt render the reſult more uncertain than that which is deduced by calculation from a ſtandard, even though not altogether perfect.

In his next paragraph, Sir George thinks 'no farmer, ignorant of practical chemiſtry, can be ſuppoſed able to manage acid, muriate of barytes, ammonia, and potaſh.' But if Sir George had attended to my deſcription, he would have ſeen, that, in general, the only chemical agent the farmer has to manage is the acid, and that if this be well managed the others are very ſeldom neceſſary. For if all the lime, and nothing but the lime, be diſſolved and waſhed from the refuſe, I would aſk Sir George what more the farmer needs to calculate the value of his limeſtone? The other agents are, therefore, only neceſſary to prevent errors, or to correct them if they ſhould occur; or, as ſtated in my paper, to enable the farmer to confirm his analyſis by ſyntheſis. But if the firſt proceſs be accurately conducted, the laſt is wholly unneceſſary.

Sir George proceeds to recommend analyzing the burnt ſtone, in preference to the raw ſtone, which is agreeable to my uniform practice, as often as I had opportunity. I may ſtate that, in moſt caſes, where I had an opportunity of making a fair compariſon between the analyſes of the raw and burnt ſtone, from the ſame maſs, the proportion of lime found in the burnt ſtone did not much vary, and often exactly correſponded with the proportion calculated from Bergman and Kirwan's ſtandards, the only ones then known to me, upon the data furniſhed by the analyſis of the raw ſtone. Any ſlight variations I imputed to ſome error in the

the process, and assumed the medium as the true value of the stone.

In p. 14. of my paper, I point out circumstances which render the analysis of the burnt, preferable to that of the raw stone; but the printer has said, 'or the stone may be analysed *before* it is burnt,' when I am certain I said, or meant to say, '*after* it is burnt.' In other places, he uses *varites* for *barites*, and *quarty* for *quartz*. If any part of Sir George's objections be founded on such mistakes, I protest I am not answerable for them.

But Sir George appears to be jocular, when he recommends dissolving 100 lib. of burnt stone in acid, with a view to ascertain its purity. This would occasion such an enormous expenditure of acid, as to be wholly out of the reach of ordinary farmers; and after all, the result would not be nearly so accurate as when only an ounce or a 100 grains were operated upon.

Those only who have attempted to reduce theory to practice, are judges of the difficulties which stand in the way of any particular operation. The analysis of burnt lime is of no value, unless it be so completely burnt as to yield no effervescence with acid. It should be weighed hot from the kiln, before it has reabsorbed any portion of its carbonic acid, or water of composition, the latter of which it greedily imbibes from the atmosphere. Being afterwards slacked, it ought to be diluted with a large addition of water, and the acid added slowly, in order to counteract the effects of the violent heat evolved by the combination of acid with quicklime.

But as the several beds in the same quarry vary in their degrees of purity, the lowest being generally best, it is evident, that specimens selected from a kiln, where they are all tumbled promiscuously, will not enable you to form an estimate of the average value of all the beds. If you attempt to burn selected specimens, by the sudden and violent heat of a smith's forge, or by other similar means, you run the risk of vitrifying the stone, unless it be possessed of very great purity.

In the papers that have come through my hands, having suggested the propriety of analyzing certain limestones after, as well as before they were burnt, in order to form an accurate estimate of their value; and having often practised this mode, I only suggest these hints, not as insurmountable difficulties, but as facts which ought to beget caution and wariness in conducting such processes.

I have thus attempted to offer every explanation that occurred as necessary, on points which seemed evidently deducible from my former communication. When I sketched off that letter, it did not occur to me that Sir George Mackenzie, or any other

perſon who is a competent judge of theſe matters, could poſſibly miſtake my meaning, and hence I endeavoured to avoid going into a wilderneſs of detail.

Unleſs, therefore, Sir George ſhall undertake to prove that my whole ſuperſtructure reſts upon erroneous principles, or demands a ſpecific explanation of ſome point on which I may have expreſſed myſelf unintelligibly, I hope this diſcuſſion will be conſidered as terminated. For I cannot help repeating my regret, that ſo many of your valuable pages ſhould be occupied with a ſort of blind man's buff, where neither of the parties underſtand what the other would be at. And I have the honour to remain, your obedient, &c.

Edinburgh, 4th June 1805. JAMES HEADRICK.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Lime. Anſwer by A. S. to Sir George S. Mackenzie, Bart.

SIR,

IN your uſeful work for February 1804, I communicated a few obſervations on the importance to farmers of aſcertaining the quality of the lime they uſe, and gave alſo ſome hints for enabling them to do ſo.

One of the methods pointed out by me was in three ſhort ſentences as follows: 'Buy a bottle of muriatic acid (ſpirit of ſalt), which may be obtained from any laboratory. Then weigh out equal quantities of the limeſtones, the comparative quality of which you mean to aſcertain, mixing together a due proportion of the different ſeams or ſtrata, that are commonly wrought in each quarry. That limeſtone, which leaves leaſt ſediment, (when diſſolved in the acid), is of courſe the beſt.'

This method I have been in the uſe of practiſing for many years paſt. I know not from whence I derived it; but think moſt probably from the late Dr Black. Indeed, it might occur to any one acquainted with chemiſtry, as ſufficient for aſcertaining the quality of limeſtone with all the accuracy neceſſary for the purpoſes mentioned in my paper.

But this mode of analyſis, as it was called, did not pleaſe Sir George Stewart Mackenzie of Coul, Baronet, a gentleman who, beſides telling us his name and addition, informs us that he had been lately a ſcholar of Dr Kennedy, who endeavoured to teach him the art of analyſis, and ſometimes employed him with ſuch ſimple materials as marl, and, when he was *difficulted*, uſed to give him directions how to proceed.

Sir

Sir George's animadverſions, ſome thought, were rather haſty, and, indeed, it appeared to me that he thought ſo himſelf, of his firſt paper on the ſubject; for, at the concluſion of his ſecond ſpeculation, he ſays, 'In making his remarks on the above, A. S. may think he has obtained a victory.' He adds, 'In this caſe I yield to him, provided he uſes pure acid; but only *till he ſtudies and practiſes the art of analyſis*,' &c.

He had, however, no occaſion to be afraid that I would make an inſulting uſe of my victory; for, as I regarded him with that eſteem naturally beſtowed on the riſing merit of a young man of fortune engaged in literary purſuits, inſtead of diſſipation; as he acknowledged that, upon trial, he aſſented to the juſtneſs of the mode I had mentioned; and moreover, as I conſidered as trivial all that he ſaid about the great danger of buying an impure acid from a laboratory, I had no intention of making any anſwer to his two papers.

Contra verboſos noli contendere verbis;
Sermo datur cunctis, animi ſapientia paucis.

Two reſpectable gentlemen, however, Mr Low of Annfield, and the Rev. Mr Headrick, thought proper to take up the matter, and to give, in my opinion, a moſt ſatisfactory anſwer to Sir George's two papers.

Mr Headrick being confeſſedly a practical and experienced mineral ſurveyor and chemiſt, I conſidered myſelf lucky in having been the means of calling him forth to give an opinion on the beſt means of aſcertaining the qualities of different limeſtones: a ſubject that I regarded as of more importance to farmers than they ſeemed to be aware of.

This gentleman, in a very excellent paper in your Magazine, approves of my obſervations, and, completing what I begun, gives full and particular directions for trying the quality of lime; and in a very modeſt manner points out to Sir George the errors in his plans of analyſis.

Not ſatisfied however with this, Sir George has thought proper to make a reply, which appeared in your laſt Magazine.

On this paper, I muſt beg your indulgence while I make ſome remarks; and as Sir George is not pleaſed to allow me to leave the field of combat, but drags me again into view in his reply, I muſt, though maſked, enter the liſts with this redoubtable knight, who, in the words of Pol-Œconomicus, inhabits the ancient caſtle of *Highland hoſpitality*.

Sir George, in his reply, alleges, that farmers may be miſled by analyzing in my way unburnt limeſtones, or carbonate, and adviſes that the ſtones ſhould be burnt, 'and afterwards the reſt

of

of the proceſs (of Mr Headrick and A. S.) ſhould be gone through with great care;' becauſe, ſome limeſtones contain larger proportions of carbonic acid than others.

To this I anſwer, that it ſo ſeldom occurs that different limeſtones have not nearly an equal proportion of fixed air in the ratio of their purity, and when it happens otherwiſe, it is in ſo trifling a degree, that this can afford no ſufficient cauſe for uſing in the analyſis burnt ſtones in preference to unburnt. But I do not diſcommend uſing burnt ſtones, if they are properly burnt; only in my former paper I obſerve, 'each portion for trial muſt be preciſely in the ſame ſtate.' Now, it is the difficulty of obtaining each portion for trial in the ſame ſtate, that makes me prefer rather the analyzing of carbonate than burnt lime. Becauſe, for inſtance, ſpecimens of the latter are in danger of being incompletely burnt or vitrified, or may, in an uncertain degree, have imbibed part of their water and carbonic acid.

Sir George alſo tells you (and it ſeems to be the principal cauſe, for aught I can diſcover, of his writing a reply at all) that he 'conſiders it as *ſuperfluous* to point out how Mr Headrick has virtually acknowledged the validity of his objections to A. S.'s proceſſes.'

In this Sir George acts with no common dexterity; but, unfortunately, the obſervation could hold ground only upon the ſuppoſition that A. S. might be unable or unwilling to write any more on the ſubject. The Baronet alleges, it is ſuperfluous to point out what he *never can find*. Indeed, no man would ever ſuppoſe that Mr Headrick could mean to acknowledge the validity of Sir George's objections to A. S.'s proceſſes, who reads his preamble. For Mr Headrick there ſays, 'The mode of analyzing limeſtones propoſed by A. S., I have reaſon to believe, was firſt ſuggeſted by me. After trying it during ſeveral years, I gave a ſhort deſcription of it in an Eſſay on Manures publiſhed by the Board of Agriculture.'

Sir George muſt, therefore, be either over ſolicitous about Mr Headrick's good opinion, or fonder of the public opinion than diſcretion warrants, when he permitted himſelf to write the paragraph above commented on; for he does not forget or paſs by the diſcovery of Mr Headrick, but tauntingly calls A. S.'s paper by the epithet of *Hints of Mr Headrick's invention*.

Now, Sir, although I could feel it as no diſparagement to have given hints of Mr Headrick's invention, and even taken leſſons from him; following the good example of Sir George himſelf, when he was taught to analyze marl by Doctor Kennedy, who, he ſays, 'when I was *difficulted*, he uſed to give me leſſons how

to

to proceed:' Yet I muſt here ſay the truth, that I never had any communication whatever with Mr Headrick on that ſubject, and do not remember ever to have read any paper of his upon it.

Sir George next proceeds to adviſe farmers to burn a piece of limeſtone completely, and to diſſolve no leſs than one hundred pounds weight of it in an acid.

This ſhows not only that Sir George is a ſerious convert, but alſo that he goes upon a grand ſcale in his experiments. Inſtead of a few grains of lime and a ſmall phial of muriatic acid, Sir George muſt, for experiments of ſuch magnitude, ſend carts with a number of horſes to carry home the whole ſtock in hand of ſome eminent manufacturer of the acid, which, indeed, proves completely what Sir George alleges in his firſt paper. 'I have had occaſion (ſays he) to uſe about as much muriatic acid as moſt amateurs of the art of chemical analyſis.' It may be added, and, indeed, at this rate, as much as all of them together.

Lime and other calcareous ſubſtances are an important material of manure to the farmer. But although they were uſed by the Romans in that way as early as the time of Pliny, and appear (at leaſt marls) to have been laid on the corn fields of the Britons, Germans, and Gauls before that period *, yet it is only ſince the new improvements in the ſcience of chemiſtry (in which our ſchoolboys now think themſelves adepts) that any attempts have been made to diſtinguiſh accurately what of theſe ſubſtances are moſt deſerving of the farmer's notice. Formerly, for want of better criteria, they were diſtinguiſhed by their colours, and were called by the ancient Greeks, Romans, and Gauls *leucargillon*, *tiburtinum*, *eglecopala*, &c. though we now know that theſe colours are derived from adventitious matters, moſt generally from iron, which are of little conſequence in aſcertaining the richneſs of the manure. Like gold ore, limeſtone is only valuable to the farmer for the quantity of the genuine material wanted which it contains. And as, to the gold refiner, it is of little conſequence to examine of what the droſs is compoſed; ſo, to the farmer, it is of ſtill leſs importance to inveſtigate what are the names and exact proportions of each ſort of earth or metal that conſtitute the refuſe of his lime. Yet it is upon this point that Sir George Mackenzie ſeems to enlarge the moſt.

This leads me back to make ſome remarks on the nature of the original

* Hedui et Pictones calce uberrimos facere agros; quæ ſane et oleis et vitibus utiliſſima reperitur. *Plin. Nat. Hiſt. lib.* 17. *cap.* 8.

original attack of Sir George Mackenzie on my paper on aſcertaining the quality of lime.

As Sir George has been very liberal in his good advices to me, be pleaſed, Sir, in return, to allow me to offer a little of my ſervice to him in that way. He remarks, 'I do not ſcruple to ſay that A. S. was rather raſh in ſending you the letter under review; and from what is therein diſplayed, it appears probable that had he been in the cuſtom of ſigning his real name, he would never have ſent you the ſaid letter.'

Give me leave to ſay, that unleſs Sir George had been a little more ſure in his premiſes, it might perhaps (but for the ſpirit diſplayed) have been fully as prudent for him to have followed the modeſty of my example, and not to have exhibited his name in your Magazine

I exhort Sir George, before he puts his name to another ſuch attack, to peruſe with care the letters of Junius to Sir William Draper; and in the words of that elegant writer I beg leave to tell Sir George, 'that I approve of the ſpirit with which he has given his name to the public; and if it were a proof of any thing but ſpirit, I ſhould have thought myſelf bound to follow his example. I ſhould have hoped that even my name might carry ſome authority with it, if I had not ſeen how very little weight or conſideration a printed paper receives even from the reſpectable ſignature of' Sir George Mackenzie.

But Sir George ſeems to conſider me as an unlearned farmer; and a farmer, according to his ideas, muſt be illiterate; judging probably of the education and acquirements and forbearance of farmers, from what he may have obſerved among ſome unfortunate, perhaps oppreſſed individuals, not unknown to the Man of Roſs. 'Strict ſcientific language (ſays he) is not to be expected from a farmer, nor ought he to be expected to be able to underſtand it; and therefore, on the chemical language of A. S. I forbear making any remarks.' All this is prefatory merely to his gravely telling me, that I ſhould not have denominated lime an *alkaline ſalt*, but a neutral ſalt that has '*properties in common with alkalis.*' Riſum teneatis!

Does Sir George believe that there are not farmers not leſs learned than he may conceive himſelf to be, and that, moreover, will not fawn like a ſpaniel to the arm that ſtrikes them?

There are farmers, Sir, who could teach Sir George pithy precepts on the regulation of labour, as well as Pol-Œconomicus.

There are farmers who could inſtruct Sir George in the principles of chemiſtry, even though he has had the aſſiſtance of Dr Kennedy and of Mr Headrick.

There are farmers who could inform Sir George of the moſt accurate

accurate plans of conducting ſcientific reſearches: and who perhaps could alſo initiate that gentleman in the polite art of being 'ſoftly ſweet' (*ſuaviter in modo, fortiter in re*) in communicating uſeful knowledge to thoſe eſteemed leſs learned than himſelf.

There are farmers that could tell him at a glance, that *difficulted* is not to be found in Dr Johnſon's or any ſtandard dictionary; and perhaps have pointed out many other unclaſſical words uſed by Sir George in his moſt elaborate compoſitions.

There are farmers who could ſhow the Honourable Baronet that he is not only deficient in purity, but in propriety of language; that the laſt ſentence of the firſt paragraph of his reply is confuſed to ſuch a degree as to be unintelligible; and that the following ſentence is a puzzle: 'His (Mr Headrick's) proceſs cannot diſcover what is wanted, any more than what I propoſed, to enable a farmer to gueſs what he wiſhed to know.'

To be incaſed in impenetrable armour is the duty of every chivalrous knight that attacks an unknown foe; otherwiſe he may be in danger of coming off but ſecond beſt in the combat. Nevertheleſs, like the celebrated cap-a-pie accoutred knight of La Mancha, who, in too great haſte to ſhow his valour and intrepidity, aſſailed the more potent arms of certain wind-mills, other doughty knights may alſo happen to be made recreants by a P. Œ. or an A. S., without being able to boaſt of deriving much credit from the adventure.

A. S.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Cement of Lime.

SIR,

HAVING ſeen in your Magazine, May 1805, a criticiſm upon a work of Mr Loudon on Planting, and in which certain doctrines concerning the ſouring of lime are introduced by *Muratore*, which, though agreeable to common practice, I conceive to be highly detrimental to cement, I beg leave to oppoſe a fact or two to Muratore's *four ſyſtem*.

Not having ſeen the work which Muratore criticiſes, I do not know whether it treats the ſubject correctly or not; nor is this of any great importance to the facts I am about to ſtate.

I enjoyed the advantage of ſtudying chemiſtry under the late Dr Irvin of Glaſgow; a man whoſe profound and accurate knowledge, eſpecially of the ſcience which he profeſſed, is well known to all who had the happineſs of his acquaintance, though it was not ſo much obtruded upon public notice as the attainments of

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ſeveral others of far inferior abilities. The Doctor repreſented ſouring as a late invention, calculated to diminiſh, or utterly to deſtroy the hardneſs of cement; and aſcribed the hardneſs and ſolidity of the cement, in antient buildings, to its having been applied immediately after the lime was ſlacked, before the barbarous practice of ſouring was known or thought of. I am ſorry I cannot lay my hands on my notes from that very ingenious profeſſor's lectures, or I would ſtate to you the ſubſtance of his doctrine on this ſubject.

But this does not ſeem at all neceſſary, as the profeſſor had an opportunity of illuſtrating his doctrine by practice, every ſtep of which I and his other pupils were encouraged to examine. I ſhall therefore ſimply ſtate his practice, as far as my recollection may enable me.

The Profeſſor was employed in making experiments with a view to the introduction of the cryſtal-glaſs manufacture at Glaſgow; and, for this purpoſe, he conſtructed a ſmall cone, with other neceſſary buildings, in a corner of the old glaſshouſe yard. The lime he uſed for cement was brought in ſhells from the country, and immediately put into a furnace, where it was kept red-hot, until it was uſed. Only one ſhovel of the red-hot ſhells was taken out at a time, and immediately ſlacked, by throwing water upon it. The powdery lime was now ſifted through a fine wire ſieve, and the knots or bits which had not fallen into powder, were thrown aſide. For every ſhovel of the ſlacked lime, three ſhovels of fine clean river ſand, from the Clyde, were ſifted upon the heap; and by the frequent change of the ſieves, care was taken to mix the lime and ſand as intimately as poſſible during the ſifting. The reader muſt obſerve, that the proportion of ſand uſed depends entirely upon the purity of the lime, which, I doubt not, the Doctor had aſcertained. I make this remark, that the reader may not ſuppoſe the proportion uſed by the ingenious Profeſſor is recommended as an univerſal ſtandard; for it is evident, that if the lime be of greater or leſs purity than what he uſed, it will require a greater or ſmaller proportion of ſand.

The inſtant that one ſhovel of lime and three of ſand were ſifted together, the heap was drenched with water, and rapidly mixed with ſpades and plaſhing ſticks, reduced to a thin conſiſtence, thrown into backies, and carried to the wall. The workmen then proceeded to form a new heap, by ſifting more lime and ſand; and a new ſhovel of hot ſhells was not taken from the furnace until its predeceſſor was exhauſted. The number of builders, of bearers, and preparers of the cement, balanced each other ſo exactly, that a backie of cement was hardly a minute in waiting until it was incorporated in the wall. The cement, though applied very

very thin, took hand almoſt inſtantaneouſly; and though theſe buildings be now of no farther uſe, it is believed they could not be removed without blaſting with gun-powder. Though conſtructed of very hard and well-baked bricks, I believe it would be much more eaſy to break down the bricks than the cement; and were Muratore endowed with the ſtrength of Samſon, he might carry this cone on his ſhoulders in a ſolid maſs, and exhibit it as an exception to his doctrine. One of the large cones of that work, which had been conſtructed on the ſouring ſyſtem, fell ſeveral years ago with a tremendous craſh, when hardly any two bricks were found to adhere. This could not have happened had they been all bound into a ſolid maſs, by a proper cement.

I remember, when Dr Irvin was engaged in this building, all the men of Muratore's profeſſion were againſt him; and he was obliged to hang over them from morning to night, to prevent them from murdering his experiment. But however they and Muratore may pique themſelves on their profeſſional experience in building, I can aſſure them I would be diſpoſed to place much more reliance on the opinions of a profound and accurate philoſopher like Dr Irvin, eſpecially when confirmed by fact, than on any doctrines which have been ſanctioned by their practice. The mole may be allowed the merit of knowing accurately many minute objects under ground, which have eſcaped the notice of other creatures; but I never heard him famed for aſtronomical obſervations, or that his obſervations in that ſcience were endowed with any weight or authority.

Muratore obſerves very juſtly, p. 240. that lime, when ſlacking, expands with irreſiſtible force; and I have actually ſeen walls and plaſter burſt and fall down, by pieces of lime ſlacking after it had been put into the wall. But does it therefore follow, that ſouring is abſolutely neceſſary, and the only noſtrum to prevent this effect, when the evil can be much more readily obviated by ſifting the lime, as was done by Dr Irvin?

In p. 239, Muratore ſeems to repreſent long ſtanding as contributing to the intimate mixture of the lime and ſand in the cement. Does he mean to aſſert that the particles of lime and ſand, when put into the ſame heap, acquire a locomotive power, that they can travel about until they find each other out, and ſhake hands? This is ſo like a doctrine which made much noiſe of late, *of an operating principle in the cauſe to produce the effect*, that I ſuſpect Muratore means to foiſt it upon us as an article of faith. I can conceive Muratore's heap to ſtand till doomſday, and yet the relative poſition of the particles to remain the ſame as when it was laid down. Long ſtanding ſeems therefore noway to contribute to the intimate mixture of lime with ſand in the compoſi-

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tion of cement; which can only be accompliſhed by a vigorous uſe of the mechanical means employed by Dr Irvin.

The young ſtudent of chemiſtry introduced at the bottom of p. 240, ſeems only to have retailed by rote what he had learned from his maſter. But I beg leave to inform that young gentleman, that if he ſaturate the lime with fixed air before he puts it into the wall, it never will take a band; and that every particle of fixed air which combines with the lime before it is applied, will diminiſh (as far as it goes) the adheſive power of the cement. Were not this the caſe, pounded chalk might make as good cement as burnt lime; which every one knows is not the caſe. If the lime be well covered, ſo as not to admit any fixed air to come in contact with it, it may be kept a conſiderable time without ſenſibly loſing its binding power; but I have known mortar that had not been kept nearly ſo long as Muratore recommends from Vitruvius, which would no more bind than ſand.

Though our young ſtudent's notions be agreeable to the common opinion, I am not diſpoſed to aſcribe the binding of mortar in a wall, wholly to the fixed air (carbonic acid) it reabſorbs. I am rather inclined to think, that a conſiderable proportion of the pure or cauſtic lime concretes or forms a chemical union with the ſilicious particles in the ſand, which excludes the readmiſſion of fixed air; and that the particles of lime which actually reabſorb fixed air, and return to their ſtoney ſtate, are ſuch as have not come in contact with ſand ſo as to form a chemical union. This is only propoſed as a conjecture; but I wiſh our chemiſts would turn their attention to the ſubject. They might ſolve the queſtion by aſcertaining whether a hundred grains of lime in old hard cement, which had never been adulterated by ſouring, contained the proportion of carbonic acid uſual in limeſtone, or even in old cement that had been weakened by ſouring. I am inclined to think the proportion of fixed air in cement that had never been ſoured will be found conſiderably leſs than in limeſtone, or in cement that had undergone that pernicious operation.

I remember when the port, and part of the town wall of Stirling were taken down, they appeared externally like a heap of looſe rubbiſh from the decay of the external facing of ſtones. But when they got into the inſide, it was found to be a ſolid rock of cement, intermixed with chips of whinſtone; and the cement ſeemed the hardeſt of the two. They were obliged to blaſt the whole with gunpowder, which proved a very long and laborious operation.

In building theſe walls, they ſeem firſt to have laid the two external faces, and then to have filled up the interval with chips and mortar. We are entitled to conclude, that ſuch walls were conſtructed

ſtructed before the abſurd practice of ſouring was invented, becauſe no walls of ſuch ſolidity can be produced in whoſe conſtruction this practice was employed. I do not mean to diſpute Muratore's great ſkill in laying his ſtones in a proper manner, or even in clenching and binding them by croſſing, and other means of art, in the execution of which there is no doubt but he may be powerfully aſſiſted by the maſon word; but I defy him to produce a ſingle example of his *foured* walls, which poſſeſſes half the ſolidity of ſome of the old *unfoured* walls, where the ſtones have no other binding but the cement. In fact, as to ſtrength and ſolidity, the old *unfoured* walls as far ſurpaſs the modern *four* erections, as the latter do a houſe of cards.

I have no intention of entering into a controverſy concerning the merits or demerits of Mr Loudon's book, which I never peruſed. But having ſeen the abſurd practice of ſouring, which is beginning to ſink in eſtimation, and would have ceaſed long ago had people known how to manage their mortar without having recourſe to it, propped by the reſpectable names of Adams and Vitruvius, recommended by the profeſſional experience of Muratore, and deriving additional authority from your Magazine; I confeſs when I ſaw ſo many buttreſſes combined to ſupport a tottering fabric, I could not be ſilent, but was irreſiſtibly impelled to lift up my feeble voice againſt it.

In practice, the humble diſciples of ſuch eminent philoſophers as Dr Irvin, have no chance when they come in competition with profeſſional men like Muratore. Often have I recommended the Doctor's mode of making and applying the mortar, to gentlemen who had conceived a paſſion for the mortar-tub, and even quoted the principles and practice of my maſter to bear me out; but, unfortunately, all I could ſay proved ineffectual. The gentlemen I addreſſed conſulted their *Muratores*, who alarmed them with bliſtered walls, tumbling buildings, in whoſe ruins the builders were likely to be cruſhed to atoms. To theſe alarming circumſtances was added a moſt long and tremendous account of loſs of lime, of labour, and of building, which vaniſhing from the graſp of the builders, if it did not break their bones, would infallibly leave them nothing on which to build but 'the baſeleſs fabric of a viſion.'

When all theſe *items* were reduced to pounds, ſhillings, and pence, which ſuch profeſſional gentlemen as your *Muratore* never failed to repreſent as inevitable loſs, to be incurred in conſequence of deviating from their ſour ſyſtem, can we wonder that honeſt farmers, or even lairds, ſhould be alarmed, and ruſh into abſurdity in order to ſhelter themſelves from riſk?

In fact, the philoſopher is like a ſharp point of ſteel, which

can only occaſionally make a ſlight puncture on the intellect even of a laird. But your profeſſional men, like Muratore, by conſtant and perſevering percuſſions, ſoon cloſes up the puncture; and even hammers the whole maſs into any ſhape they may find moſt convenient.

Having ſtated, Sir, a practice by which ſouring was wholly ſuperſeded, I hope no more of your pages ſhall be polluted by ſouring, unleſs your correſpondent Muratore be prepared to bring forward much ſtronger arguments in its favour than any he has adduced. My opinion is that he cannot do this, and will only expoſe himſelf by the attempt. He refers to authorities. I refer to facts, which are as open to his inſpection as to mine. And I have the honour to remain, Sir, your obedient humble ſervant,

Edinburgh, 12th June 1805. ANTI-SOURING.

FOR THE FARMER'S MAGAZINE.

On the modern Improvements in Agriculture, as they affect the Price of Grain.

WE have heard of improvements in this art that did not render the ſoil more productive: but I have no view towards ſuch ideal matters in the following paper; my views are directed and confined to thoſe improvements, of later years, by which the earth has been rendered more productive for the ſupport of mankind.

Whatever increaſes the produce of the earth, may be admitted to have a tendency to reduce the prices of that produce; yet I have known reſpectable authority quoted for the following maxim, viz. 'That all our improvers of the ſoil raiſe the prices of corn!' An opinion that has the air of paradox, and yet has met with much countenance. I have no private intereſt in diſcuſſing this opinion; and at one time, reflecting on the high expences attending modern culture, I felt inclined to adopt it; but, on particular and mature reflexion, it appears to me an error, which, for the good of mankind, ought to be refuted. It has an obvious tendency to throw diſcouragement or odium on the moſt intelligent and ſucceſsful cultivators of the ſoil, a claſs of men to whom their country owes more than has been generally underſtood; for I am certain, that if we had not enjoyed the fruits of their ſkill and labour, we muſt have oftener been viſited with ſcarcity, and famine alſo, than we have been, and in more ſerious degrees. I am likewiſe ſatisfied, that our modern and productive improvements in agriculture have had a ſtrong tendency to keep down the prices of corn.

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It is certain, that by increaſing the groſs produce of corn or grain throughout the kingdom, the prices would be reduced, provided that all other things remained unaltered. Now, by cleaning foul lands, enriching poor ſoils with new manures, and bringing barren lands into culture, there has been much done to enlarge that groſs produce by our modern improvers.

But the price is regulated, much more by the *marketable ſurplus*, after ſeed and bread have been deducted by the farmer, than by the *groſs amount* of corn produced; and, in this reſpect, the good effects of modern culture are undeniable. For, in clean, rich lands, much leſs ſeed is required, and fewer hands are able to manage an equal extent of ground; therefore, by ſaving the ſeed, and the grain uſed in the farmer's family, as is done in well dreſſed lands, with improved modes and implements, there muſt remain a larger ſurplus for the market, which has an undoubted effect to keep down the prices.

If liberal men, who delight in improving their lands, have incurred uncommonly heavy expences, it may be ſuſpected that ſuch men will combine, and endeavour to indemnify themſelves by raiſing the prices; and that ſpeculators, who have ſunk money in falſe ſchemes of improvement, will readily join them in this effort. We may admit the ſuppoſition, and yet, conſiſtently, deny the concluſion. Theſe men have, in all caſes, *followed* the markets, without, in any one inſtance, being able to *lead* them. In fact, the effects of real improvements reſemble thoſe of Sir Richard Arkwright's extenſive machinery, which enabled him to underſell others. The profits of good management, well choſen implements of huſbandry, and judiciouſly applied manures, are always greater, at the ſame prices, than thoſe which reſult from an inferior ſyſtem, in a courſe of years. This may ſerve as a full anſwer to the above mentioned idea, too raſhly entertained by many, againſt intelligent improvers. With regard to ſpeculators, did ever any of them ſucceed in leading the markets of grain? Have they not, for the moſt part, been puniſhed for their folly and raſhneſs, by the ſequeſtration and ſale of their eſtates? No claſs of men are more jealous of theſe ſpeculative pretenders than decent practical farmers, who, ſo far from entering into concert with ſuch men, have no confidence in any thing they ſay or do.

Improving farmers who, beſides grain, raiſe and bring to market other articles of ſubſiſtence, muſt be allowed to have merit in ſo doing, for the purpoſes of reducing the prices of grain. Purchaſers, who find ample ſupplies of potatoes and other vegetables fit for the ſubſiſtence of mankind, and alſo quantities of fat meat, will not purchaſe ſo much grain as they would other-

wiſe have done; nor will they give ſo much for what they buy, as they muſt have done, if there had been a more extenſive demand for the ſingle article of corn. The difference betwixt ancient and modern times, in this particular, is great indeed!

It may be aſked, therefore, why the prices of grain, in money, are not much lower, by all theſe means, than in our forefathers' days? This queſtion admits of the following ſatisfactory anſwer, viz. That the value of money has fallen ſo much, as to give no certain index of the comparative real value of corn. I recollect perfectly that the price of labour, in a certain diſtrict, about twenty years ago, was not above a third part of what it is there at preſent, eſtimated in money; yet the value of the labour was really much the ſame as it is now, and it is the value of the money that has fallen. But by this fact, taken as a rule, the labourer who receives three times the old wages, might have his grain equally cheap as before, and pay three times the old price: yet this has not happened, for it has not riſen in that proportion; and, when we reflect on the greatly increaſed population, which has created new and more numerous purchaſers, we may be ſatisfied, that to anſwer theſe increaſed demands, an increaſed ſurplus of marketable grain is neceſſary. We may alſo remark, that an increaſe of luxury among the conſumers, has effected more waſte, or at leaſt a greater conſumpt, than was known in former times. And when the numberleſs carriage and ſaddle horſes, now moſtly fed on corn, are taken into account, along with our increaſed luxury, and augmented population, together with the enormous advance in the price of land, implements, ſtock, and labour, it muſt appear aſtoniſhing to every man of ſenſe, that corn can be afforded for the late and preſent prices. It is impoſſible to believe that it could be afforded at theſe prices, if the productive improvements of the ſoil had not operated, in an important degree, to furniſh greater ſupplies, and keep the prices within moderate bounds.

I am of opinion that leſs breadth of land is ſown with corn, now, than formerly, becauſe much land is occupied with other valuable crops for the uſe of man, which our anceſtors did not cultivate; yet I believe that the groſs annual produce in grain exceeds what it did anciently, and that the marketable ſurplus at preſent is not much leſs than double the ſurplus that our forefathers enjoyed, and it is this marketable ſurplus that determines the price; the demands being ſuppoſed equal, and the value of money alſo. But that ſurplus is undeniably increaſed, by our modern productive improvements, at every ſtep, from ſeed time, to market day. There is leſs ſeed wanted for an acre; fewer hands can till the ground with better effect; and there is leſs

conſumpt

conſumpt of grain therefore in the farmers' houſes; and under an improved culture, the ſoil being clean and rich, the returns are probably nearly doubled on an acre. I admit that corn muſt be given to the farm horſes, and that ſome is uſed in feeding cattle and ſwine, in neither of which ways our anceſtors employed their grain to any great extent; but ſenſible farmers do not waſte ſo much corn on their horſes as is generally believed; and as to what is uſed to feed cattle and ſwine fat, it returns to market in another ſhape, and contributes, in this latter ſhape, to the ſubſiſtence of the public. But the poſt, ſaddle, and carriage horſes, conſume an immenſe quantity of corn; and if the marketable ſurplus were not enlarged, to anſwer them, and the numbers and luxury of an increaſing population, it would not be poſſible to find corn for our modern markets. Our importations, great as they have been in ſome years, and exhauſting to the treaſure of the kingdom, are inconſiderable, compared with our immenſely extended internal demands.

I believe it may be as near the truth as any other ſuppoſition that occurs to me, to ſtate the extent of lands now under corn, leſs than the old extent under crop, for the reaſons mentioned above, in the proportion of three to four. Labour was formerly cheap in compariſon, and work and implements imperfect. I ſhall therefore ſtate the hands employed on an acre formerly, more numerous than at preſent, for the culture of corn, in the proportion of three to two; which infers a proportional conſumpt of grain in the houſe of the farmer, for each equal or given extent of land ſown with grain. Foul land, eſpecially if poor alſo, requires more ſeed than ſuch clean land, at leaſt in the proportion of four to three, on an equal extent. And if we allow a ſixteenth of the crop, over and above the drawn corn, for the modern farmer's work horſes, we have then obtained ſome data, on which to draw out a table, ſhowing a ſketch of the comparative groſs produce, and comparative marketable produce of corn, in ancient and in modern times. Theſe hypothetical data are not offered as certain; but only as reaſonable, and probably approximating towards the truth.

Table drawn up according to the foregoing Data, ſhowing the comparative Extent or Breadth ſown in Corn, the Quantities of Seed, the Conſumpt by the Farmers, the Groſs Returns, and the Marketable Surplus, in Ancient and in Modern Times.

In former Times.		In improved Farms.	
Extent of land ſown with corn, ſay 40 acres.		Proportional extent now in corn, 30 acres.	
Seed, in foul land, poor for the moſt part, at 1¾ boll per acre, -	53½ bolls	Seed for 30 acres cleaned and manured land, at 1 boll each, -	30 bolls.
For bread and all kinds of conſumpt in the farmer's houſe from grain, anciently not much under ⅓ of the whole crop, ſometimes above it, ſay - - -	70 bolls.	Proportional allowance for 30 acres to find bread and other conſumpt for the farmer, in grain, in the reduced ratio ſtated formerly, -	35 bolls.
For horſes no corn allowed, except the light grain.		For horſes 1-16th of the groſs produce, beſides the light grain, - -	15
Drawbacks for ſeed, bread, &c.	123½ bolls.	Drawbacks for ſeed, bread, and horſes, - -	80
Groſs produce from 40 acres of corn, in the old management, at 4 ſeeds, (ſeed 53½ bolls), - - -	213½ bolls.	Groſs produce from 30 acres of corn in the improved management, at 8 ſeeds, (30 bolls ſeed), -	240 bolls.
Surplus for market, -	90 bolls.	Surplus for market, -	160 bolls.

By this table, admitting a greater extent under corn in the old ſyſtem, yet the groſs returns of grain appear larger now, as 240 to 213½; and the marketable ſurplus, which ought to regulate the price, appears to exceed the old ſurplus, as 160 to 90. The exact proportions it is impoſſible to aſcertain; but the principles on which this computation is founded, can hardly be called in queſtion by any well informed perſon. And if on leſs ground we have now more ample ſupplies of corn in the market to anſwer the demands for bread, and the immenſe demands for carriage and ſaddle horſes, and for porter, ale, beer, ſpirits, pot barley, and ſtarch,—to what, except to our improved agriculture, can this reſult be referred? This ſyſtem has brought much uſeleſs land into full produce, enriched the barren outfields, eradicated weeds, introduced economy in ſeed and conſumpt ſo far as the farmer is concerned, and highly increaſed the fertility of the lands preſently in corn; while to theſe benefits have been alſo ſuperadded, the advantages of excellent productive green crops, highly uſeful, directly or indirectly, for the ſupport of mankind. Let us beware, therefore, of imputing the high prices of grain, if ſuch there be, to our improved ſyſtems of agriculture. Were it not for theſe improvements, we ſhould not have poſſeſſed the means of ſubſiſtence under the immenſely

menſely increaſed demands for grain in all its forms. Still leſs could we have enjoyed the means of extending the comforts of life in the manner which has been effected by a mixed huſbandry, including a rich variety of other produce beſides grain, particularly fat cattle and ſheep, vegetables, and dairy produce of every kind, together with the materials of woollen and linen fabrics, of the tan yard, and wood of every deſcription. An enlightened view of the increaſing returns, in all theſe ways, for the comfort and ſubſiſtence of ſo many millions of people, inhabitants of the Britiſh empire, muſt be ſeen with ſatisfaction by every wiſe and good man. For my own part, I am thoroughly convinced, that (under God) we are indebted to our productive improvements in agriculture, for anſwering, to ſuch an extent, our immenſe demands for grain; and frequently averting from theſe lands the horrors of famine,—otherwiſe, in my opinion, inevitable. And ſo long as my heart expands with pleaſure in contemplating the riſing population and comforts of this great empire, I ſhall not ceaſe to eſteem thoſe men who promote her agriculture, and lay this foundation of her ſubſiſtence, her peace, her comforts, and all her uſeful arts.

Upper Annandale, 8th January 1805. ALPINUS.

NOTE.

The Conductor's ſentiments on the above intereſting ſubject are very much in uniſon with thoſe expreſſed by his reſpectable correſpondent; as a proof of which, reference is made to Vol. I. p. 241, where, under the character of a *Rural Inquirer*, he ſtated his opinion concerning the immenſe benefit received by the public from the modern agricultural improvements. It gives the Conductor much pleaſure that the crude ideas then thrown out have been ſatisfactorily illuſtrated by an abler hand; and he earneſtly requeſts a continuance of this gentleman's correſpondence. N.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Benefit of uſing Caſt Metal for the Hinges of Gates.

SIR,

I BEG leave to intimate, for the information of your readers, that I have recently tried caſt-iron for the hinges of wickets, which is ſo light, and at the ſame time anſwers the purpoſe ſo well, that I think theſe circumſtances muſt be a great means of extending the uſe of caſt-metal for gates.

Meſſrs Dearmans, Francis & Co., Eagle Foundery, Birmingham, have the patterns; and the weight and value of the caſtings are as follows:

Set of hooks and thimbles for a wicket, 3¼ lib., at 3¼d., *thirteen pence.*

Theſe have been attached by me to a ſtrong wicket weighing 75 lib., and withſtand all violence in ſhutting the wicket.

The method of putting on the thimbles is the ſame as for thoſe of the gates; but the hooks have ſhafts for driving into the poſts, which ſhould be done with a wooden mallet.

I truſt that many of your readers will be induced to try theſe hinges, as it may be done at ſo trifling an expence. I am, Gentlemen, yours, &c.

Oſweſtry, 14th March 1805. THOS. N. PARKER.

FOR THE FARMER'S MAGAZINE.

An Account of the Moſs Improvements of John Wilkinſon Eſquire of Caſtlehead in Lancaſhire. By Sir John Sinclair, Bart.

HAVING heard much of Mr Wilkinſon's moſs improvements in Lancaſhire, and being deſired, by that ſpirited agriculturiſt, to examine them upon the ſpot, I was tempted to quit the line of the great weſtern road from Edinburgh to London, and from Kendal to go to Caſtlehead, a place ſituated on that arm of the ſea which divides the diſtrict called Furneſs, from the reſt of Lancaſhire. It is well known that the ſea overflows there an extenſive tract of country, which Mr Wilkinſon, and ſome other friends to improvement, would gladly have reſcued from its preſent miſerable ſtate; but however practicable the plan was conſidered to be, yet various obſtacles of a legal, a local, and a perſonal nature, have hitherto prevented its being carried into effect. *

On approaching Caſtlehead, the appearance of the country denotes, that a ſpirit of improvement could only have been recently introduced into it. The roads are in ſome places very ſteep, going over the ridges of hills, inſtead of being conducted round them.

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* In the General View of the Agriculture of the County of Lancaſter, publiſhed by the Board of Agriculture, anno 1795, there are ſome intereſting obſervations on the embankment of Lancaſter ſands, from which it would appear, that at an expence of from 150,000 l. to 200,000l., about 38,710 acres might be recovered from the ſea, which are of no value in their preſent ſtate, but which, if improved, would ſoon become worth 1,348,400l. Mr Wilkinſon offered to ſubſcribe 50,000l. for carrying on this great national undertaking.

them. Large tracts of moſs land are ſeen in a ſtate of nature. The fields, whether encloſed for graſs, or cultivated by the plough, (at leaſt ſo far as it is poſſible to judge from their preſent appearance), are in much the ſame ſtate that they probably were a century ago.

Mr Wilkinſon was originally led to think of acquiring any property in that neighbourhood, with a view of making iron from the peat with which the country ſo much abounded. But as that mode of manufacturing iron was attended with great diſadvantages, from the quantity of fuel required, and the difficulty of procuring it in ſufficient quantities, more eſpecially in rainy ſeaſons, he was thence led to give up that attempt, and to conſider what other uſes could be made of ſo extenſive a tract; in particular, whether it could not be made capable of cultivation.

Nature of the Moſs.—Nothing could be more diſcouraging than the general nature of the moſs he undertook to improve. It was what is called in Scotland '*a flow moſs.*' On an average, about five feet of it conſiſts of a ſoft, ſpongy, light kind of peat, which makes very weak and bad fuel. Below that ſtratum, the peat is black, and of excellent quality. The depth of this ſecond ſtratum is very great, in many places fifteen feet, and even more. The bottom, where it can be got at, is a fine, ſtrong, blue clay, which is unfriendly to vegetation until it has been long expoſed to, and ameliorated by the atmoſphere. Calcination in ſmall heaps with peat, fits it for a top dreſſing on graſs lands; or this kind of clay might be made very uſeful, by ploughing it in, mixed with lime. In the moſs, conſiderable quantities of old trees are found, principally oak and fir, and often in ſuch a ſtate of preſervation, that they can be uſed for various purpoſes. They ſeem all to have been thrown down by the force of ſome violent tempeſt, by a general or partial deluge, or by ſome great convulſion of nature.

The moſs, in its original ſtate, was ſo ſpongy, that, ſince it was drained, it has ſubſided conſiderably, and in ſome places has ſunk from three to four feet.

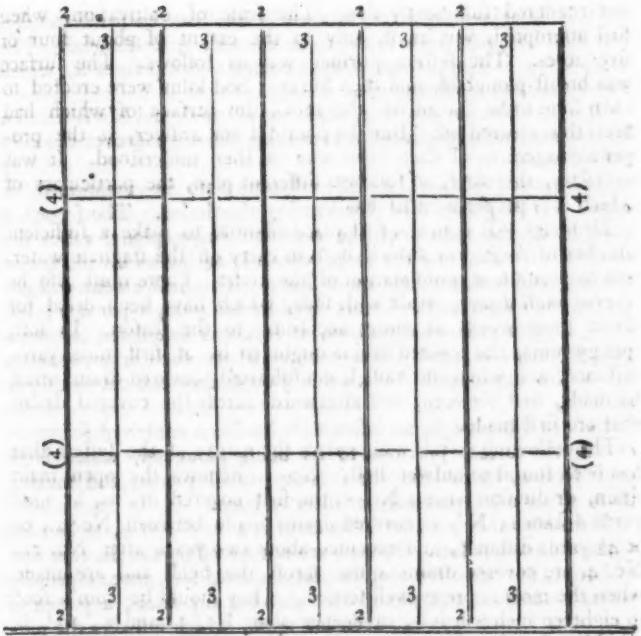
Original Value.—From this account of the nature of the moſs, it can hardly be ſaid to have had any original value whatever, excepting for fuel. The liberty of paſturing on ſuch land, (which could only be done in froſty weather), has been offered for ſo ſmall a conſideration as three halfpence per acre; but nobody thought it worth their while to take it even at that rate. A penny per acre therefore, is a high eſtimate for heath, only to be come at during a long froſt.

Plan purſued.—The firſt attempt to improve any part of this tract was *anno* 1778, when ſome general drains were made; but being cut at too great a diſtance from each other, the moſs was not

not rendered ſufficiently dry. The ſcale of cultivation, when firſt attempted, was ſmall, only to the extent of about four or five acres. The ſyſtem purſued was as follows. The ſurface was breaſt-ploughed, and then burnt. Sod kilns were erected to burn lime to be ſpread on the moſs, the ſurface of which had been thus cleared off. But the plan did not anſwer, as the proper management of theſe kilns was not then underſtood. It was neceſſary, therefore, to follow a different plan, the particulars of which it is proper next to detail.

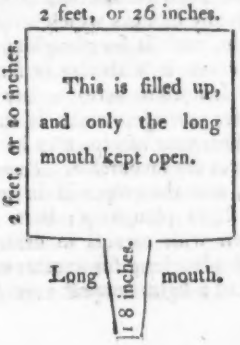
Drainage.—It is in the firſt place eſſential to make a ſufficient number of *large open drains*, both to carry off the ſtagnate water, and to promote a conſolidation of the moſs. There muſt alſo be *covered ſmall drains*, made with ſods, which have been dried for about three weeks or more, according to the ſeaſon. In ſoft, ſpongy moſs, the covered drains ought to be at firſt nine yards diſtance, and when the moſs is conſolidated, covered drains muſt be made, firſt between, and afterwards acroſs the covered drains that are firſt made.

The following ſketch will explain the nature of the ſyſtem that has been found to anſwer beſt. No. 1. denotes the open main drain, or diviſion fence; No. 2. the firſt covered drains, at nine yards diſtance; No. 3. covered drains made between No. 2., or at 4½ yards diſtance, and executed about two years after No. 2.; No. 4. are covered drains quite acroſs the field, and are made when the moſs is pretty well ſettled. They ſhould be from a foot to eighteen inches below, or deeper than No. 2. and 3., and, if properly placed, will complete the ſolidity of the moſs.



(1) The main drain or diviſion fence.

The drains marked No. 2, are from 2 to 3 feet wide, and 2 feet deep. Theſe drains lye open ſometimes for a year. The ſods are dried for covering the long-mouthed drain, as it is called, which is 18 inches deep, and 4 inches wide at the bottom. The nature of this ſort of drain will appear from the following ſketch.



It is imagined by ſome, that moſs land can be made too dry, but that has not been found to be the caſe at Caſtlehead. The moſs being ſo deep, there always comes a damp from it, which keeps the land moiſt enough.

Roads.—Next to draining, roads are eſſential, and Mr Wilkinſon has been extremely ſucceſsful in making them good over the very ſofteſt moſs.

Inſtruments uſed.—The firſt inſtrument to be mentioned, is called *a tom ſpade*, uſed for cutting the drains. The ſecond a plough, of the nature of the common ſwing plough; but the coulter is ſteeled, and the ſock, which is 14 inches broad, is alſo ſteeled, and both are kept quite ſharp. This inſtrument will not do ſo much work as the Cambridgeſhire fen plough per day; but being ſimpler in its conſtruction, it is better calculated for general uſe, more eſpecially in a country where ſuch improvements are to be introduced. With this plough they can cut as thin as an inch.

Beſides this plough, an inſtrument has been contrived for croſs-cutting the ſurface previous to its being ploughed, which is of great ſervice, by dividing the ſods into ſmall pieces, and making them either more portable, or fitter to burn.

The only other peculiar inſtrument is a *horſe patten*, to be uſed when the moſs is ſoft. Pattens are not neceſſary for the fore feet of horſes, but are often required for the hind feet, more eſpecially when the moſs is firſt ploughed. After many trials, a patten of a circular form has at laſt been hit upon, which anſwers the purpoſe effectually. Perhaps a ſimilar contrivance might be of uſe for oxen, or for horſes with bad feet. Before this invention, the ploughs were wrought by the ſtrength of men till the moſs had conſolidated.

Rotation of crops.—Before the land can be laid down with graſs ſeeds, the following plan, after the draining and other previous operations have been completed, is purſued. *Firſt year*, burn the heath, with any hillocks which were cut off in order to make the ſurface plain, and fit for ploughing. Plough the moſs 7 inches deep, then cover it with clay or ſand, or mould (1000 ſingle horſe carts per Lancaſhire acre), as any of theſe articles may lye moſt convenient for carriage, which is the point to be principally attended to. This year turnips may be ſown, if the ſeaſon and other circumſtances are favourable. *Second year*, after a ſlight ploughing, ſow oats, and the crop will in general be excellent. *Third year*, another ſlight ploughing; burn any clods that may appear, and lay down with turnips in drills. *Fourth and fifth years.*—Then a fourth ploughing for another crop of oats. When the oats are cut, ſpread a light compoſt over the ſtubble, and after

a ſlight ploughing, ſow winter rye, which always produces a good crop; and in April, when the froſts are over, ſow graſs ſeeds on the winter rye, and roll them in. The land is thus brought into graſs, in perfect good order, and may be paſtured with much advantage for five or ſix years, when the graſs may be renewed, without ploughing up the land again, by which the drains might be diſturbed.

The advantage of this ſucceſſion is, that you are pretty certain of four or five good crops (two of oats, one of winter rye, and one or two of turnips), which will pay a conſiderable ſhare of the expence of the improvement.

Beſides theſe crops, barley has been tried, and anſwers well; and the potatoes raiſed on moſſy land, are of a quality peculiarly excellent. Coleſeed would certainly produce good crops.

Expence of the above proceſs.—No particular eſtimate has hitherto been made of the expence. The covering, at the rate of a 1000 cart loads per Lancaſhire acre, may be calculated at 8l. 15s., or 2d. per cart. The expence of draining, making roads, &c. muſt depend upon various circumſtances.

Kind of Oat.—The beſt kind of oat, for the firſt crop, is the Scotch dun, or the *Nanny pye oat*. Afterwards a heavier ſort may be tried.

Graſs ſeeds.—Red clover does not anſwer; and the land, when laid down to graſs, produces white clover of itſelf. The following has been found the beſt proportion of graſs ſeeds, 10 lib. of trefoil, 10 lib. rib-graſs, and 6 buſhels of hay ſeeds.

How to renew the graſs.—In the courſe of five or ſix years, the graſs is very apt to get foggy. It may be renewed by the following proceſs. Spread, at the rate of 40 Lancaſhire, or 120 Wincheſter buſhels of hot lime, per Lancaſhire acre, and as hot as poſſible, in the month of July. Immediately after liming, run it over with a ſhort ſharp-toothed harrow. The hot lime and the ſun will deſtroy the fog, and new and finer graſs will ſpring up.

What Manures.—Neither lime nor dung had any material effect upon the moſs, till it was reduced to ſoil. The ſtagnate water in moſs, called in Lancaſhire *aidle water*, is highly pernicious, and is injurious to animals that drink any water with which it is mixed. By ploughing the moſs often, expoſing it to the influence of the atmoſphere, and mixing it with other ſubſtances, the *canker*, as it is called in ſome diſtricts, is extirpated. The froſt has a great effect in reducing moſs to ſoil; and after the moſs is froſted, the influence of the ſun is beneficial. The moſs muſt be rendered dead matter, before it can become productive. Lime has then an effect, and dung ſtill more. But nothing has anſwered better than burnt clay. Low-canal field, containing about 4 acres,

acres, was manured with burnt clay at the rate of 80 ſingle horſe carts per Lancaſhire acre. It has ever ſince been mowed annually, and is the beſt meadow land for hay in the pariſh.

For turnips, the burnt aſhes anſwer particularly well; and it has been obſerved, that the fly never attacks the turnips where they have been manured with aſhes, more eſpecially if the ſeed has been pickled, as wheat uſually is, previous to its being ſown.

Shelter.—Birch, alder, plane, black poplar, and mountain aſh, thrive well on moſſy lands; and if, where quicks are planted, the moſs is properly mixed with clay or ſand, they will alſo thrive well.

Graſs, how managed.—The land muſt at firſt be tenderly dealt with; and it is in general much better to paſture than to mow it. Sheep have not been tried. The Highland ſorts are much liked, both as they are light, and feed quickly: but the Galloway are on the whole preferred, being tamer, and doing leſs miſchief. Sometimes young cattle from the neighbourhood are taken in to graze; and that plan pays well.

Preſent value.—For paſture, in its preſent ſtate, the new improvements would let at from 30s. to 40s. per Lancaſhire acre, and the land that was improved ſome years ago, at double that ſum.

Extent of the moſs improved.—Mr Wilkinſon has already improved, or is in the courſe of bringing into cultivation, no leſs a quantity than about *five hundred Lancaſhire* acres of this kind of ſoil.

Concluſion.—Such is the ſubſtance of the information I was able to collect regarding this great improvement, which, conſidering the unproductive nature of the moſs, the expence neceſſary to improve it, and the ſucceſs with which it has been attended, can hardly find a parallel in any part of the United kingdom.

Narrow-minded and ignorant people, I underſtand, have endeavoured to decry this great and important attempt. They ſay that Mr Wilkinſon might have bought, at a cheaper rate, the beſt land in Lancaſhire. Perhaps ſo. But Mr Wilkinſon muſt derive much higher ſatisfaction from the plan he has purſued. By ſo doing, he has furniſhed employment to numbers of induſtrious people;—he has raiſed great quantities of food for man, where nothing, but for his exertions, would have been produced;—he has ſhewn a noble example to his neighbours, if they chooſe to follow it;—and by augmenting the value of 500 acres of a barren waſte, from 2d. to 30s. per acre *and upwards*, not merely for a few caſual crops, but on the principles of ſubſtantial and permanent improvement, he is juſtly entitled to be ranked among the beſt friends to the agricultural intereſts of the country.

London, 25th April 1805.

TO

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Improvement of Moſs in the Iſland of Collonſay, one of the Hebrides.

SIR,

You are requeſted to inſert in your Magazine, the following extract of a letter from a friend in Iſlay, relative to the improvement of moſs land; and I have only to add, that the gentlemen therein mentioned, are juſtly entitled to be conſidered as true friends to huſbandry, conſequently as perſons who eminently promote national proſperity in the ſphere wherein they are placed.
I am, yours, &c. D. M.

'THE reluctance of people in general to improve moſs land, induces me to requeſt that you will give a place in your uſeful and widely circulated Magazine, to the following ſhort account of a very extenſive and ſucceſsful undertaking of that nature by Mr John M'Neill.

'On two of his farms in the iſland of Collonſay, he improved two pieces of moſs land; one containing 5 acres 1 rood and 37 falls, which he drained, levelled and ploughed the harveſt preceding; and the other 1 acre and 37 falls, all Scotch meaſure, in the manner recommended by Mr Smith of Swinridgemuir, and planted the whole with potatoes. The former yielded a crop of 20 tons per acre, and the latter 27 tons 16 hundred weight, alſo per acre.

'Mr M'Neill is a man of much enterpriſe, and takes every opportunity of adding to the comfort of the inhabitants of the iſland of Collonſay, often ſacrificing his intereſt to ſo deſirable an object. His brother Mr Malcolm M'Neill, who was agent to Colonel M'Neill, is equally aſſiduous in that reſpect; and, from theſe cauſes, few or no peaſantry in the Highlands of Scotland enjoy more real comfort, notwithſtanding the various diſadvantages they labour under, owing to their inſular ſituation, many of whom, from the encouragements held out to them, might otherwiſe be tempted to adventure to foreign climes, uncertain what they might meet with there.

'The population of Collonſay not affording ſufficient encouragement for a reſident ſurgeon, that want is but little or not at all felt by the inhabitants, from the attention of Mrs M'Neill, who always has a large ſupply of medicines, which ſhe adminiſters with much ſkill and judgement, ſeldom or ever miſſing an opportunity of ſeeing them in their illneſs, and in every reſpect relieving their wants. To have been an eye-witneſs to the parental care of theſe people to the comfort of the inhabitants, was highly gratifying, and worthy of imitation.'

[Sir

[Sir George Stuart Mackenzie of Coul, Bart., with a view to benefit agriculture in a department hitherto too much neglected, having authoriſed us, in the firſt Number of this Volume, to offer a gold medal, of five guineas value, to the authors of the beſt eſſay on the ſtoring of turnips and ruta-baga, ſeveral eſſays were in conſequence tranſmitted to us. After an attentive examination of theſe eſſays, and taking the opinion of a gentleman of undoubted abilities, whoſe practice in the culture and management of turnips may be conſidered as more correct and extenſive than almoſt that of any other profeſſional man in this country, we have adjudged the premium to the author of the following eſſay. It becomes us at the ſame time to ſtate, that Sir G. S. Mackenzie has, on this occaſion, not only done great honour to our Magazine, by bringing forward ſuch an intereſting diſcuſſion through its medium, but alſo contributed much to diſſeminate information on a ſubject, which confeſſedly is of much importance to the breeders and feeders of ſtock, particularly in the northern parts of this iſland, where at all times the weather is variable and tempeſtuous, and often accompanied with ſuch heavy ſtorms of froſt and ſnow, that recourſe cannot poſſibly be had to the field, for a ſupply of food to the beſtial kept in the ſtraw-yard and feeding-houſes. Some other of the competition eſſays will, with the permiſſion of their authors, be inſerted in our after Numbers.]

FOR THE FARMER'S MAGAZINE.

Eſſay on Storing Turnips, which gained the Premium offered by Sir G. S. Mackenzie.

——res eſt non parva.

THE cultivation of turnips, on light ſoils, may be conſidered as one of the principal improvements introduced into the huſbandry of this country. By this improvement, farm labour is much alleviated, being more diffuſed through the year. Land naturally of an inferior quality, and apt to get foul by annual and perennial weeds, is kept clean, and becomes better adapted for growing barley than what is originally of far richer quality. A large, if not a copious ſupply of manure is obtained; and arable farms not only maintain a greater quantity of live ſtock, but the quality of that ſtock is much improved; ſuch as are deſigned for ſlaughter being fattened with more facility, than by any other known method; and ſtock of every deſcription is kept on through winter in a growing ſtate, and puſhed to maturity,

turity, with much more expedition, than when allowed to become hide-bound and weakly, by being fed with ſtraw only, during that ſeaſon.

But, that theſe important advantages may be enjoyed in their utmoſt extent, no inconſiderable degree of attention is required on the part of the farmer. It is by no means ſufficient, that he raiſes a weighty crop of turnips, that he provides a ſuitable ſtock of ſheep or bullocks to conſume them, and that he apportions the daily allowance, ſo as the crop may fatten theſe, or ſerve as a kind of condiment to their ſtraw through the ſeaſon. In North Britain, the winter cold is ordinarily ſo intenſe, that turnips cannot be drawn from the ground; nor, ſuppoſing that difficulty overcome, are they nouriſhing food for cattle whilſt their juices are in a frozen ſtate: beſides, if the crop has attained maturity, great part of it will be completely deſtroyed; a misfortune which every one muſt conſider as of no trivial nature, who reflects, that it often occaſions the loſs of all the extra condition to which the feeding ſtock has been brought, and renders it impoſſible to fatten them off that ſeaſon. To this deficiency in his immediate profits, the farmer has to add an incalculable loſs in the derangement of his ſyſtem, in conſequence of being deprived of the ordinary ſupply of manure. He muſt therefore take the precaution of preſerving the turnips from deſtruction by cold, and of ſecuring a regular ſupply as wanted, and that in an edible condition.

The methods of accompliſhing this, muſt vary according to circumſtances, ariſing from the ſoil and climate, the mode of cultivation, and of conſuming the crop, and the ſpecies of turnip raiſed.

1*mo*, When grown on wet land, the crop cannot be eaten off; and on this kind of ſoil, it is much more liable to rot in winter, than when raiſed on what is termed ſound turnip land; conſequently there is a neceſſity for drawing them much earlier in the ſeaſon.

2*do*, Thoſe, again, in high-lying inland ſituations, or northern climates, are expoſed to much more intenſe cold, than ſuch as are grown in maritime diſtricts, or the ſouthern parts of the iſland.

3*tio*, When turnips are ſown early in the ſeaſon, or when they are raiſed to a large ſize, they are ſure to become corkhearted by the beginning of winter; and in that ſtate, are exceedingly apt to be hurt by wet and cold. It is partly for theſe reaſons, that in Norfolk, and the ſouthern counties, their turnip ſuffers little in winter comparatively with ours in Scotland. The far greater part of the turnips in that diviſion of England, is

ſown either broadcaſt, or in drills, with intervals of only 12 inches; ſo that the horſe-hoe is entirely excluded; conſequently the bulbs never attain the ſize of ours, drilled with intervals of 30 inches, and dreſſed both by the hand and horſe-hoe.

In this country, too, it is thought neceſſary to have the turnips ſown by the middle of June, or as ſoon after as the ſowing can be accompliſhed. If any part is purpoſely delayed after the end of that month, it is only with the view of avoiding the hurry ariſing from having a great breadth to clean at one time. But we find one of the very firſt agriculturiſts in the ſouth of England (Mr Ducket at Eſher) ſowing his turnips ſo late as the 10th of Auguſt.* Sown at that ſeaſon, the plant does not come to maturity, even in the mild climate of Surry; of courſe, it behoves to be uncommonly hardy. The writer of this eſſay every year ſows an acre or two towards the end of July, with narrow intervals, and ſets out the plants much cloſer than uſual, and he finds that very few of them periſh in winter.

4*to*, When turnips are eaten off the ground, little can be done in ſecuring the crop from froſt. But there is ſome reaſon for ſuppoſing, that it is only in ſome diſtricts of Scotland that this can be practiſed with ſucceſs; at leaſt, by means of hurdles or nets. In the genial climate of the low lands of Haddington and Berwickſhires, where ſnow ſeldom lies longer than a few days, and where little rain falls, the practice has indeed been thought extremely beneficial. But we are not to conclude from this, that it is equally advantageous in diſtricts where ſnow lies long, and, even when at laſt it diſappears, is infallibly ſucceeded by rainy weather, ſo that the ſheep are ſtanding to the belly either in ſnow or mud.

5*to*, There is great difference in the hardineſs of the ſeveral kinds of turnips cultivated. The Tankard turnip is the beſt adapted for eating off, the bulb growing almoſt wholly above ground; but it is found, for the ſame reaſon, to be the moſt liable to ſpoil by froſt; therefore, muſt be either conſumed in the beginning of winter, or ſtored up. The Red Top was formerly thought the moſt hardy, but is leſs palatable to cattle, on account of the greater pungency of its rind. The Green Top, and a kind lately diſcovered, of a form rather oblate than ſpherical, are now ſaid to be the ſpecies beſt adapted for reſiſting our winters.

But none of theſe, when arrived at maturity, can be depended on for withſtanding the wet and cold of this climate, unleſs previouſly drawn from the ground, and put under cover. The common Dutch, or Orange turnip of the gardens, is more durable. It requires no other treatment than the field kinds, excepting

* See Houſeman's Tour.

cepting that it ſhould ſtand cloſer on the ground, both in the drills and intervals, ſince it does not attain the ſame ſize; and as it is ſown at the ſame ſeaſon, it affords more time to work the land than a ſpecies which requires earlier ſowing. Though it rarely gives an equal weight of produce per acre, we are not thence to infer that the quantum of nouriſhment is leſs, as it is much more ſolid, and better reliſhed by animals of every kind. It muſt, however, be drawn from the ground before winter; for, although not ſo apt to ſpoil as the field kinds, it is no leſs liable to become corky.

But the ſpecies known by the names of Swediſh Turnip and Ruta Baga, is not in the leaſt injured by winter weather, however continued the rain, or intenſe the cold; and though a portion of the bulb be bit, or cut away, the remainder will continue freſh, and even ſend up a healthy ſeed ſtalk in ſpring. This root never becomes ſo large as the field turnip, therefore, ſhould be more cloſe on the ground; and, though the crop is leſs bulky, yet, as the ſpecific gravity is greater, and even that weight leſs juicy, the produce of nouriſhment of an average crop, on a given ſpace of ground, is little inferior. It has, however, one diſadvantage; it muſt be ſown three weeks earlier, conſequently, there is leſs time to clean the ground of root weeds; and, as its foliage is leſs umbrageous, annuals find leſs difficulty in maintaining their ground. But, as it bears tranſplanting tolerably well, the firſt of theſe objections is ſometimes obviated, by raiſing it in ſeed beds, and dibbling in the young plants where they are to ſtand for good, at the time of ſowing the common turnip. The ſame quality renders it of great uſe for filling up ſuch ſpaces in the crop of any of the other kinds as have failed. The bulk of its foliage too may be increaſed by extra manuring.

It is the opinion of many intelligent perſons, that Ruta Baga delights not in dry and light ſoils, like other turnips, but that it prefers a moiſt, heavy loam. Though the writer annually ſows an acre or two of this root, principally for his horſes, he does not find himſelf juſtified, from experience, to aſſent to this opinion. He has always found the one ſpecies as readily hurt by any exceſs of moiſture as the other. Both Swediſh and Dutch are alſo found to improve the quality of milk and butter, when given to cows, contrary to the nature of common turnip, which imparts to theſe a nauſeous flavour. And the writer ſpeaks from experience when he ſays, that much heavy work may be performed by horſes fed on theſe roots and hay, and the horſes ſtill be kept in prime condition; no winter food whatever giving a coat equal to this. Turnips, both Orange and Swediſh,

have this further to recommend them over potatoes as food for horſes, that there is no danger of giving them as many as they chooſe to eat at any time. In a crop of Swediſh turnip, there are always ſome of a white, and others of a yellow colour, but theſe are only varieties. The writer raiſes his own ſeed; and having once planted only yellow bulbs for this purpoſe, he found the turnips produced from the ſeed, partly yellow, partly white, as uſual, though no other Swediſh turnips were in blow for ſeveral miles around him.

The ſpecies called Turniprooted-cabbage is not unlike the Swediſh turnip, in ſeveral of its qualities, and in the appearance of its leaves. It requires to be ſown at the ſame early ſeaſon, bears tranſplanting, is never injured by the utmoſt ſeverity of winter; its root has a hard thick rind, and ſolid internal ſubſtance, and continues edible after its ſeed-ſtalk has attained conſiderable height. Indeed, it has been extolled, by ſome Engliſh agreſtical writers of conſiderable eminence, as the beſt of all the turnip kind for furniſhing ſucculent food late in ſpring. The writer tried the cultivation of this plant ſeveral years, both tranſplanting and ſowing the ſeed in drills, but never found it ſuperior to the Swediſh turnip in any reſpect whatever; in ſome it is inferior. It does not give an equal weight of crop; its root, inſtead of a ſolid bulb, uſually conſiſts of a number of branches or fangs, whoſe ſmaller ramifications have ſuch hold of the earth, that they cannot be pulled up by hand. It was therefore always found neceſſary to turn over the drill with a plough, and then ſhake out the roots; and, even in this way, many pieces were left in the ground, and much earth and manure adhered to thoſe taken away, which rendered it neceſſary to waſh them before they could be given to any kind of ſtock whatever. But never having ſeen it cultivated by any other perſon, the writer will not preſume to ſet his opinion up in oppoſition to that of ſo many firſt-rate agriculturiſts in South Britain, as have given Turniprooted-cabbage a character, as a green crop, ſuperior to every other for late ſpring food.

Both this and Swediſh turnip are complained of, as unfit for crones, or very old ſtock of any kind; becauſe their hard ſkin is apt to pull or break out the beaſts' teeth. But it is a fact, the truth of which any one may eaſily ſatisfy himſelf of, by ſtrewing on the ground a quantity of each kind mixed together, and turning on the beaſts, that ſheep, cattle, and horſes, prefer Orange and Swediſh turnips, and Turniprooted-cabbage to field turnip. And this holds good of the leaves and ſeed-ſtalks, equally well as of the bulbs. Of this the writer has had repeated experience. He uſually ſows a quantity of late turnip for ſpring

feed.

ſeed. Common, Swediſh, and Orange turnip, and Turniprooted-cabbage, blow at different ſeaſons; a quantity of each kind is therefore ſown. If, then, at any time the whole is paſtured, not a plant of the common field kinds is touched, whilſt a blade of the Swediſh or Dutch turnip, or Turniprooted-cabbage, is to be found.

There is ſtill another vegetable which has been cried up as excellent ſpring food. This is the Turnip-cabbage. Though the botanical character of this plant ranks it in the Braſſica genus; to a common obſerver, it differs widely from every other ſpecies. Its edible part conſiſts neither of a congeries of leaves at top, like the common cabbage, nor of a bulbous root, like the turnip, but of an enlargement of the ſtalk above ground, whence riſe the leaves, not unlike the pine apple. It is ſaid to be particularly well calculated for reſiſting drought and heat, even after being drawn from the ground. But, as far as the writer can judge from experience, (and he tried the cultivation, by every method he could think of for ſeveral years), it is a worthleſs plant, never giving any thing like even a middling crop. It is liable to ſuffer from cold; and never can ſtand a competition, in this country, with Swediſh turnip, in any one reſpect. It is probably indigenous to the north of Europe; as the writer recollects of a quantity of the ſeed being brought, by an acquaintance, from Gottenburgh, ſome thirty years ago, where he alleged it was cultivated in gardens merely for culinary purpoſes.

The houſing of the turnip crop in the end of autumn, has long been practiſed on a ſmall ſcale in ſuch places in Scotland as are unencloſed, yet cultivated this vegetable. Indeed, there could be no alternative, in a country where the whole ſtock paſtured the fields in common, but either to do this, or ſee the crop devoured at once.

In Norfolk, again, they have a cuſtom of covering their turnip with earth whilſt ſtanding in the drill. When the intervals are wide, this earth is taken from the middle of them, by a plough, and turned over the bulbs; ſomething like what is done in ſetting up. But when the rows ſtand cloſe, at the diſtance of only twelve inches, every ſecond one is drawn, and carried off, and the earth on which it ſtood turned over thoſe next it. But this practice is far from being univerſal in that county, as moſt of their turnips are ſown broadcaſt; and it would not by any means ſuit our climate. Every raiſer of turnips in Scotland knows how laborious the grubbing up of that root is, during a hard froſt, even though they ſtand on the top of the ridge: but to quarry them from under two frozen plits, would certainly be expenſive in the extreme.

As has been already obſerved, the Scotiſh farmer, if he reſolves

to have the command of his turnips in all ſeaſons, muſt, before winter, put his crop under ſome kind of cover, that can more eaſily be removed than the frozen earth.

The month of November, or beginning of December, is the proper ſeaſon for this purpoſe. It, however, ought at all times to yield to the more preſſing operations on the farm,—ſuch as wheat-ſowing; except when it is meant to ſow that grain after the turnip, and potatoes are taken up,—as a much ſlighter degree of cold will hurt theſe than turnips. It ſhould not, however, be delayed long, leſt the froſt ſet in too intenſe, to permit it to be eaſily effected.

The Swediſh turnip and Turniprooted-cabbage may indeed be allowed to ſtand till the drawing them can be conveniently overtaken, as they run no danger of rotting; but they will turn corky; and if wheat is to be the following crop, they ſhould always be drawn in the beginning of November at fartheſt.

Like moſt other operations in huſbandry, there are ſeveral methods of ſtoring turnip. Some carry off the whole crop; others draw only a third, a half, or two thirds, but moſt commonly every alternate ſix rows; allowing the other ſix to remain for hurdling off with ſheep. Some, again, cut off the leaves in the field, as the turnips are drawn, and plough them (the leaves) in for manure. Others cart off the whole plants, top and tail them at home, giving the leaves, whilſt freſh, to their ſtore beaſts: and, not unfrequently, turnip are to be ſeen put up in ricks, or heaps, in the field, without being either topped or tailed. Any way, the buſineſs is very ſimple; yet ſome attention is required, in cutting off both the leaves and top-root. If the leaves are not taken cloſe to the bulb, they ſoon ſpring again; on the other hand, if either they or the top root are taken off too cloſe, ſo that the bulb is wounded, it will inevitably rot. Some people have thought, that the taking off the top-root is unneceſſary; but on a comparative trial it was found, that, when allowed to remain, the turnip began to ſhoot, or exhauſt itſelf much earlier in ſpring. All burſten and unſound roots ſhould be thrown aſide, and firſt uſed, becauſe they ſoon rot in the heap, and ſpoil the others. Turnips keep better without doors in a heap, if ſufficiently covered, than in a houſe; owing probably to the effluvium which they emit, (and which from all the Braſſica genus is extremely putrid), being allowed to eſcape more freely in the one caſe than in the other. Theſe heaps are commonly made of an oblong form, eight feet broad at the baſe, and brought to a ridge, as high as the bulbs will admit of; which, on a baſe of this width, will be about four feet. The length and number of theſe will, of courſe, be determined by the quantity of turnip to be ſtored. An ordinary

nary crop will require, per acre from 30 to 35 yards in length, if the dimenſions of the heap, as to height and breadth, be as above.

A far better method is, to dig trenches or hollows ſeven feet wide, and ſtore the turnips in them. But this is impracticable, wherever the ſubſoil is retentive of moiſture, as the bulbs would be aſſuredly rotten in theſe. Therefore, in ſituations of that deſcription, the beſt way is, to build two parallel walls, at the diſtance of ſeven feet; the height not to exceed three, becauſe turnip in a large maſs are apt to ſpoil. Theſe walls may be of turf, or, what would be far better, of clay or mortar, having ſix inches of ſtone or brick in the foundation. At bottom, the thickneſs may be eighteen inches, bevelled to twelve at top They ſhould be copped with flags of ſtone, or old turf. The carts, loaded with the turnip bulbs, are then backed within theſe walls, and the heap formed into a ridge above them, and thatched over. This method is in the end the cheapeſt: an ordinary labourer will anſwer well enough for conſtructing the walls, ſo that the expence is but trivial, and, if kept dry, they will laſt an age.

Where feeding is carried on extenſively, a number of ſuch buildings, of a moderate length, erected near the feeding byre, will always be found more convenient than one of ſuch a length as would contain the whole ſtock of turnip. Theſe ſhould be placed parallel to each other; yet each ſtore muſt have its proper walls, becauſe, if theſe were mutual, the roof water could not be ſo well conveyed away.

There are ſeveral methods of thatching, or covering the turnips, whether placed ſimply on the ſurface of the ground in heaps, or ſtowed within theſe parallel walls. Some have uſed earth for this purpoſe, dug from a trench around the turnip, like what is uſually practiſed in pying potatoes. But this is expenſive at firſt, and ultimately inconvenient; as, in ſevere froſt, it is laborious work to get at the turnip. The beſt ſubſtances are ſtraw, ruſhes, or fern, as theſe are by no means loſt, being neceſſary for littering the beaſts. Theſe ſhould be laid on thatchways, to the depth of ſix or eight inches, and ſecured by ſtraw ropes, ſpare rails, the loppings of trees; or, for want of all theſe, flat ſtones, ſpits of earth or turf laid on ſuch parts of the thatch as are moſt likely to be diſturbed by wind. The ridge ſhould be particularly attended to, by an additional layer of thatch placed acroſs, ſo as one end may overlop the upper part of each ſide, and a ſpar of wood laid along above all.

The extent of building, neceſſary for containing any given quantity of turnip, may be nearly aſcertained as follows. An ordinary crop of turnip, topped and tailed, will occupy about

1600 cubic feet per acre. A building, ſuch as has been mentioned, ſeven feet wide, three high at the ſide, the turnip raiſed three and a half in the middle higher than the eaves, will, including the ſmall bevel of the walls, give about 34 cubic feet per lineal foot; ſo that about 47 feet in length will contain the crop. In every caſe, a conſiderable proportion of the turnip crop need not be removed from the ground till wanted for immediate uſe; a circumſtance which ought by no means to be overlooked in eſtimating the expence of ſtoring. Indeed, it cannot be ſaid that any extra expence is incurred by this practice. When the crop is drawn, as daily wanted through the winter, a horſe or two, and cart, muſt be excluſively allotted for carrying it home, which, by this means, is not needed; and the trouble of drawing or cutting up the turnips in time of froſt, is incomparably greater than when performed in open weather, even including the cutting off the leaves and top-roots. Beſides, frozen turnip are of very little uſe, for either fatting or ſtore beaſts. To all theſe may be added the advantage, in northern latitudes eſpecially, of having the land cleared in ſeaſon for a crop of winter wheat, in place of a ſpring one. Field and Swediſh turnips allowed to ſtand in the ground, begin to ſend up their ſeed ſtalks by the middle of March: ſtored before winter, they keep very well till the beginning of May in the Lowlands of Scotland. Even after that period, there is ſtill three or four weeks before any kind of green food come into ſeaſon, excepting ſome of the Braſſicæ. This diſmal chaſm may be filled up by ſowing a crop of broadcaſt Orange turnip in September on an early oat ſtubble. This kind is later by a fortnight than any of the others in ſending up its ſeed ſtalk; and even after that riſes, it continues tender and ſucculent till the bloſſom appears. So that, if a field of winter rye has been alſo provided, there is no danger of being a ſingle moment without green food throughout the year; and the land on which the late turnip has grown, may very well be brought into preparation for turnips in June. That which produces the rye, may likewiſe either be prepared for a crop of June turnip; or, after taking one good cutting for houſe-ſoiling, may be allowed to run to grain, with conſiderable ſucceſs, as the writer has more than once experienced.—*6th June* 1805.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Curſory Thoughts concerning the Management of the Great Poſt Road running through Eaſt Lothian.

SIR,

THE advantages which the agriculturiſt enjoys from good roads, are numerous and manifeſt; and, indeed, experience ſhews, that no country can be improved to any conſiderable extent, unleſs a ready and eaſy communication is opened betwixt its different parts. Without reaſoning in ſupport of a propoſition, which few will be diſpoſed to contradict, I ſhall, with your permiſſion, briefly offer a few remarks on the preſent ſtate of the great poſt road which paſſes through the county of Haddington, and ſuggeſt one or two things, which, if adopted by authority, and carried ſufficiently into execution, would be of much benefit, not only to the inhabitants of that diſtrict, but alſo to perſons of every deſcription who are travelling to the metropolis.

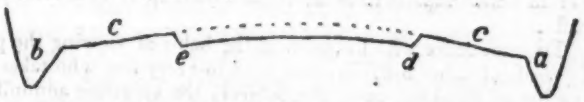
Eaſt Lothian (the ordinary name given to the greateſt part of the county of Haddington) procured the firſt turnpike bill in Scotland for repairing public roads; and to this very circumſtance may, in a great meaſure, be attributed many of the defects which confeſſedly prevail in its road adminiſtration. The line choſen for the great poſt road was, in many places, naturally unfit for affording a free and eaſy communication to thoſe who uſed it. In more places than one the road was carried over high grounds which might eaſily have been avoided; and the wideneſs, though perhaps at the time commenſurate to the agricultural and commercial ſtate of the diſtrict, is, in numerous inſtances, altogether within the limits neceſſary for the increaſed and increaſing number of horſes and carriages which are conſtantly paſſing alongſt it. Theſe original defects, much to the credit of the truſtees, have been partially remedied and corrected; but, as generally happens in every other buſineſs where wrong plans have been adopted at the outſet, can never be completely removed. The jarring of private intereſt alſo, often retards public improvement, though obviouſly and indiſpenſably neceſſary; and the expence required to carry ſuch into execution, is an argument never loſt ſight of by thoſe who are hoſtile to the meaſure from mercenary motives. Without attempting to diſcuſs the propriety and utility of ſome alterations which have, with much judgement, been propoſed on the great poſt road, becauſe ſlender expectations can be entertained of their being carried into execution, I ſhall paſs on to the main object of this letter, namely, to point out the imperfect and unſcientific manner

ner in which repairs have been made thereupon for ſeveral years paſt.

To a traveller who has been in the habit of viewing the public roads of other diſtricts, and even to every one who takes the trouble of thinking upon the ſubject, the operative adminiſtration of the Eaſt Lothian poſt road muſt appear ſingularly defective. Originally covered with gravel or ſtones, to the breadth of ſixteen feet or thereby, ſucceeding repairs have generally been made by piling up freſh materials on the top of the original fabric, till the road, in many places, has been made to reſemble ſomething like the roof of a flat houſe. As broken ſtones are now only uſed, and that to the thickneſs of ſeven or eight inches, without being blended with ſand or ſmall gravel, no horſe or carriage will take upon the places repaired, unleſs compelled by neceſſity; ſo, of courſe, the ſoft, or ſummer road as it is called, on the ſides, is reſorted to till it is rendered unpaſſable, and the whole thrown out of ſhape. Wheel carriages are then forced to take the high metalled ridge; and when two meet, the one that goes off the centre is in danger of being overſet. Let any perſon examine a piece of the road recently made, about a mile and a half to the eaſtward of Haddington, and he will inſtantly be ſatisfied that no exaggerated deſcription is here preſented. In ſhort, the public ſafety calls for making up the ſouth ſide of that road with earth, or ſome other materials, before winter ſets in, as was lately done for ſeveral miles weſtward of Haddington, otherwiſe ſerious conſequences may be dreaded by every perſon who travels in the night-time. The reaſon why I condeſcend on the ſouth ſide of that road is, that the ditch ſcourings have ſerved to preſerve ſomething like a proper ſhape on the north extremity, which cannot be gained on the other without artificial aid.

It has often occurred to me, that, inſtead of heaping ſtones upon ſtones, as preſently practiſed, it would be much better, were a part of the old materials digged up, and thrown to the extremities, by which means the gulphs on each ſide would not only be filled up, but the road itſelf would in time be covered in its whole breadth with hard materials. A firm bed would alſo be thereby got for the new metals, whilſt the acclivation of the road would be conſiderably reduced; and, in fact, ſuch a convex ſhape as was judged moſt expedient might be preſerved over its whole limits. A figure, copied from Dr Dickſon's complete body of huſbandry, will explain my meaning more diſtinctly than the moſt elaborate deſcription.

The



The above figure ſhews the manner of forming a convex road, in which *a* and *b* exhibit the ditches or drains on the ſides; *c c* footways, or horſe roads, when ſufficiently wide; *d* and *e*, a convex line, ten or twelve inches lower at *d* and *e* than the footway. The ſpace ſhewn by the dotted line is to be filled up with hard materials.

It muſt be attended to, that Dr Dickſon gives the above figure as a model or plan of the beſt way of conſtructing a new road; whereas, the uſe I make of it is, to explain my ſcheme for repairing an old one. Suppoſe the ſpace below the dotted line occupied by old materials, let the workmen begin about nine inches from the extremities, which leaves a kind of wall for boxing in the new metals, and dig ſix inches deep, more or leſs, according to circumſtances, ſloping gradually upwards till they come to the centre, and throwing the materials, thus digged out, on the ſoft or ſummer roads on each ſide. I ſay, by this mode, a road, originally ſixteen feet wide, would at once be widened to twenty or twenty-two feet, which might be extended when future repairs were made; whilſt its ſhape would be rendered much more ſcientific and uſeful, than can poſſibly be attained to when new materials are applied, without a preparation or bedding being made for their reception.

Having thus noticed, in a curſory manner, the chief defect in the preſent operative ſyſtem of repairing the great poſt-road, running through the county of Haddington, allow me juſt to notice the alterations which have been propoſed on the line now in uſe, and to hint at an entire new line to a certain extent, where the public at large would travel through the diſtrict with greater facility, whilſt the expence incurred in making it would not be greater than would certainly be called for, were the propoſed alterations to be executed.

To thoſe acquainted with the face of the diſtrict, I need hardly mention that, with the exception of a mile loſt in going round by Dunbar, the preſent line of poſt-road is a good one, till you paſs Linton-bridge. Here, however, you aſcend a hill of conſiderable elevation, choſen perhaps becauſe of its height, in order that travellers might have a good view of the adjoining fertile country; though this hill might eaſily have been avoided, by taking the river Tyne on either ſide. After deſcending this height, commonly called *Poncraik*, the road is nearly level, till you arrive at Haddington;

dington; but from that place there is almoſt a gradual riſe for three miles, which riſe is loſt more precipitately after paſſing Tranent, before you reach the flat land on the banks of the Forth, and a ſevere pull given to thoſe travelling eaſtward. To ſhun theſe riſing grounds eaſt and weſt of Haddington, various plans have been offered, none of which are impracticable; though I cannot help being of opinion, that a new line, which would leave Haddington about three miles on the right hand when travelling eaſtward, would be infinitely more eligible.

It is not my wiſh to take up too many of your pages at this time with a ſubject chiefly local, though one in which the public at large are certainly much intereſted. I confine myſelf, therefore, merely to hint, that the beſt line of poſt road would be got by following what is called the north poſt road from Wallyford toll to the village of Drem, and from that place to make a new road for five or ſix miles by Gilmerton to Linton Bridge, where the preſent line would be taken up. In this way, the public at large would have a ſafe and eaſy road; travellers would paſs through one of the beſt cultivated and moſt agreeable diſtricts in Britain; and theſe acquiſitions would be gained, in my humble opinion, at an expence leſs than would be required, were the alterations on the preſent line which I have alluded to, carried into execution.

The preſent great road from Linton weſtward might be kept under the turnpike ſyſtem, which would allow as good a communication with Haddington and the coaleries as is preſently furniſhed.

Various other matters might have been mentioned in this letter, ſuch as the nature of the contracts entered into for ſupporting the roads, the depth of metals applied, and the duties incumbent on the general ſurveyor; but theſe, for the reaſon already aſſigned, ſhall be reſerved for another communication. And I am, yours, &c.

AN EAST-LOTHIAN MAN.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Turnip Caterpillar.

SIR,

THE dark-coloured worm that ſo generally appeared in the turnip fields laſt ſeaſon, and was productive of very deſtructive conſequences, attracted my attention; and I here beg to hand you a few obſervations reſulting from my inquiries.

They were firſt diſcovered in the fields in this neighbourhood about

about the 23d of July. On the 26th, I picked up 20 of them. I firſt uſed means to kill them, and put them in wine for a quarter of an hour, others in the juice of oak bark, very ſtrong, for the like time; but neither had the effect. I then tried them in whiſky for five minutes; and although they ſeemed ſtupid and almoſt motionleſs on taking them out, they ſoon recovered.

Finding theſe attempts fail (and although ſucceſsful practical farmers would probably not have adopted them), I next determined to follow out their own operations. Accordingly, I had a white iron box about eight inches long, two deep, and two wide, in which I put them along with turnip, peaſe, potatoe, roſe-cabbage, raddiſh, bean, and lattice leaves, and I obſerved the worm range through them eagerly till the turnip was found out, which was fixed on immediately. I alſo put in a ſmall turnip. On the 27th, the turnip leaves were much eat. On the 28th, the cabbage and raddiſh were holed, but in a very trifling degree. On the 29th, nothing particular appeared. On the 30th, ſome more of the cabbage was eat: and I now found five of the worms lying in neſts, as it were, very thin, and the ſides as high as their own back,—two upon the turnip leaves, two between the whole turnip and the root of the ſhaw, and one on the potatoe leaf. I likewiſe obſerved a number of dry ſkins, in appearance like the worm. At three in the afternoon they had left their neſts, and I then removed the leaves firſt given them, and put in a freſh ſtock of turnip leaves from the garden. 31ſt, two were covered quite over in the neſts, and I could not diſcover that they had eat any of the leaves. On the 3d Auguſt, they were all, to appearance, dead; but, on touching them, they moved. 7th, two apparently dead, and of a brown colour; the others as I found them on the 3d, and I did not diſturb them. 14th, except ſix, and thoſe in the neſts, all the others were ſeemingly dead. The ſkin of theſe ſix was quite freſh, and I thought life was in them. 20th, two of the ſix had changed colour to a very light green. I ſaw the form of a head, ſhoulders, wings, and a number of legs of a clear white colour. I noticed one move. 21ſt, no viſible alteration. 26th, except theſe two, and thoſe in neſts, the others appeared to be dead. On the 3d September, I obſerved two completely formed flies, orange-coloured body, three feet on each ſide, the wings longer than the body, black head, and two horns. They jumped about, quite active, but did not attempt to fly. Two remained in their neſts, and one in the ſtate I found it on the 20th Auguſt. I put in ſome freſh turnip leaves. 9th September: this day another was in full form and hopping about, and one lying in the half-formed ſtate before noticed, and motionleſs. On looking in to them

them on the 10th, the three flies were dead. I alſo perceived what I conſidered to be two eggs, yellow coloured, of a barrel ſhape, the eighth part of an inch long, and about the thickneſs of a ſmall pin.

I forbear to deduce any concluſions from the progreſs of this moſt deſtructive creature; and not being a farmer, have no opportunity of practiſing any experiments. At ſome particular ſtage it may occur to you, that it can, in ſome meaſure, be got the better of; and, in that view, I have been the more minute. I have the dead flies, eggs, &c. which are at the ſervice of you, or any of your readers, who may wiſh to inquire more particularly into the matter; and you are at liberty to make what uſe of the foregoing facts you pleaſe. And with beſt wiſhes for the ſucceſs of a publication ſo well calculated for uſeful and general information as the Farmer's Magazine, I am, &c.

Peebles, June 1805. B.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Remarks and Obſervations on the Smearing of Sheep.

SIR,

OF all the animals propagated and reared with ſo much care for either the uſe or pleaſure of man, I think the ſheep claims a great preeminence: whether we conſider it as an article of food, or of clothing, it particularly merits our attention: and thoſe perſons who have laboured much, either to improve the carcaſe as an article of food, or the fleece as an article of clothing, equally merit the thanks and gratitude of their fellow citizens.

The neceſſity of ſmearing ſheep, in certain ſituations, ſeems to be confirmed by long experience; but in what particular reſpect this contributes to the health or preſervation of the animal, has never yet been perfectly aſcertained, at leaſt as far as I know, nor perhaps has the ſubject ever been fully inveſtigated. Does its utility ariſe from the adheſive nature of the tar binding the wool cloſe on the animal, and by this means preventing the cold from penetrating, or is there ſomething in the nature of tar which promotes the health, or adds to the ſtrength and vigour of the ſheep? I can ſcarcely think the latter to be the caſe, as many inſtances are known where the tar has ſo far penetrated the fleſh of the animal as to cauſe its death. As far as I am acquainted with the nature and properties of tar, I do not think that the rubbing or ſmearing of any animal with this ſubſtance can be conducive to its health. The properties of tar, conſider-

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ed as a medicine, are known to be of a very active nature; and I am apt to think that both caution and judgment are neceſſary, either when it is adminiſtered internally, or by outward applications. Another bad property of this ſubſtance is the colour or tinge it gives to the wool, which no means yet known can perfectly eradicate; ſo that the value of the wool is greatly reduced, being rendered unfit for many of the moſt valuable purpoſes of the manufacturer. The greaſe, with which the tar is mixed, muſt certainly have a moſt pernicious tendency, when we conſider that the moſt rancid and half putrefied butter, and the very worſt ſorts of oil are the ſubſtances uſed; and were it not that the nature of the tar in ſome degree corrects the putrid tendency of ſuch ſubſtance, the moſt fatal conſequence would undoubtedly follow; as I am fully perſuaded, that, notwithſtanding the correcting property of the tar, ſuch ſubſtances prediſpoſe the animal to be infected, both with maggots, and every other ſort of vermin. It is likewiſe a well known fact, that oil or greaſe, in place of rendering the ſkin more impervious to the cold, makes it much more ſuſceptible of it. If theſe obſervations therefore are well-founded, the principal uſe of the tar can only be to bind the wool cloſe to the animal, and by this means prevent the cold and wet from penetrating ſo much as it would otherwiſe do; and the only uſe of the greaſe, to give the tar a capability of being ſcoured or waſhed from the wool. I will now beg leave to ſuggeſt ſome improvements to the candid conſideration of thoſe who are neither wedded to old cuſtoms and prejudices, nor too quickly influenced with new opinions. I think it would be no difficult matter to prepare a ſolution of ſome gums, and other reſinous ſubſtances, together with a certain proportion of ſoda, or ſome alkaline ſalts, the properties of which are known to be of an antiputreſcent nature, and muſt certainly be more conducive to the health of the animal than the materials at preſent in uſe. A compoſition of this nature would give no tinge or colour to the wool, but what could readily be removed by the uſual proceſs of ſcouring or waſhing, and might eaſily be made of an adheſive nature, ſo as to fix the wool in the ſame manner as tar does.

But if tar muſt be uſed, it would ſurely be preferable to mix it with ſome ſubſtance of a ſoapy nature, or ſome article ſtrongly impregnated with ſoda or other alkaline ſalts *, as the power or nature of ſuch ſubſtances to reſiſt every kind of putrefaction is now fully proved by the moſt incontrovertible experiments. Even the bathing or waſhing in ſalt water is known to be the beſt preventive

* I am informed that ſome vegetable ſubſtance of this nature was ſold by Mr George Gray in Hawick laſt year.

preventive againſt catching cold; but all oils and greaſe of every ſort ſeem to have quite the contrary effect. What I have wrote I ſubmit to the ſuperior judgement and long experience of others; and if any thing I have ſuggeſted ſhould be of the ſmalleſt uſe either to individuals or ſheep-farmers in general, the writer will feel himſelf highly gratified.

Banks of the Tweed. I. G.

[We have indulged Mr Loudon, for whoſe profeſſional abilities we entertain conſiderable reſpect, by inſerting the following remarks on the ſtrictures of *Muratore* given in laſt number; but he muſt excuſe us for ſoftening ſome paſſages, and omitting others, which would have given offence, without being of any benefit to himſelf.]

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

SIR,

When I peruſed in the laſt number of your Magazine (p. 238.), obſervations upon my book, by a correſpondent who ſigns himſelf 'Muratore,' I confeſs I felt myſelf influenced by a mixed ſentiment of indignation and aſtoniſhment.

There is a principle in every man which teaches him to repel an attack, whether levelled at his intellectual or profeſſional abilities: in the former reſpect, it is perhaps at beſt but a matter of curious ſpeculation, but, in the latter, it becomes a ſubject of prudence and of honour. I ſhould, indeed, conſider myſelf as acting with decided diſingenuity towards the public, if I either advanced theories which have no foundation in common ſenſe or in practice, or if I ſhrunk from vindicating them when attacked by malignity.

But, before I enter into an examination of my adverſary's arguments, I muſt beg leave to congratulate him, with all ſincerity, upon the modeſt form of his attack; contented to be the humble retailer of humble remarks, of which the authors themſelves, *if any ſuch there be*, will probably feel aſhamed. But, for my own part, I ſuſpect that my adverſary has ſhrouded *his own* remarks beneath this fictitious garb, perhaps in imitation of 'the table-talk of Xenophon' (for he ſeems to dabble in claſſical literature): If ſo, while I pay a deſerved compliment to his learning, I *muſt* feel indignant at his meanneſs, which would not allow him to come forward with the conſcious integrity of a man who knows he is right, but induced him to make his attack from behind the covert of a fictitious appellation.

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It may be premiſed, though a well known fact, that, in every branch of ſcience, innovations, however well grounded, will not only provoke the inquiry of liberal-minded men (and which is perhaps the higheſt honour the author of ſuch innovations can look for), but alſo ſet in action the baſer paſſions of thoſe whoſe *liberality* is 'as Oſſa to Pelion,' and who have not ſenſe enough to aſcertain whether ſuch innovations be right or not, nor ſpirit enough to adopt them if they be ſo; for little minds are generally infected with that bigotry to old forms, which is ſure to keep them in a ſtate of primitive ignorance:

'La docte antiquité fût toujours venérable;
Je ne le trouve pas cependant adorable.' BOILEAU.

I will not deny that, for my own part, I expected not only the former, but alſo a conſiderable ſhare of the latter; and your correſpondent has amply convinced me that my expectations were well grounded.

My antagoniſt firſt informs us, that a gentleman 'who was well acquainted with the ſubject,' pronounced me, with much metaphorical elegance, to be '*raw* and ignorant,' whenever I introduced my own ideas; aſſerted that I 'copied from Evelyn, Millar, Hanbury, Anderſon, and Marſhal;' and declared, that however much merit there might be in the work, this merit was not my own. But let the gentleman remember that aſſertion is not argument; and that though the former may paſs very well at a *tea-table*, it is by no means fit to influence the world in a book.

But, taking this aſſertion in the way he probably meant it, it evidently implies, either that my work is principally compoſed of the ideas of thoſe writers, or that it abounds more with quotations from them than with my own compoſition, or elſe that I am a plagiariſt. Now, which of theſe three he meant to imply, I really do not know, nor am I very ſolicitous to inquire; but, upon the manifeſt tendency of the obſervation itſelf, I ſhall make a few remarks.

I have no heſitation in confeſſing, that, in thoſe parts of my work which relate to planting, I have freely availed myſelf of the opinions of other writers whenever they coincided with my own. My intention, in compoſing the book, was to produce a uſeful practical work, reſerving to myſelf the power to correct and amend wherever I thought correction and amendment neceſſary, and to recommend whatever of antecedent practice might be eligible or advantageous. And let me aſk this maſon-critic, what other line he would have recommended to me? Would he have had me retail *old* errors in an *old* dreſs? If ſo, why publiſh a work which teaches no more than what was already known? Or would he have wiſhed me to reject all that is uſeful and praiſeworthy in the labours of my predeceſſors, in order to build a new-

fangled ſyſtem of my own? Believe me, '*raw*' as I am, I know too well the value of thoſe labours to neglect them; and I ſhould deſpiſe the man who had the preſumption to imagine, that he could do *alone*, what has not yet been done by the united efforts of *many*.

All improvements in ſcience have been progreſſive. The contemplative genius of a Bacon traced an outline which the active mind of a Newton partly filled up; but, in the intermediate ſpace between theſe too luminaries, a Boyle, a Huygens, and others, contributed their individual exertions: and are we to condemn them for having left undone what Newton was deſtined to complete? In my opinion, the man who contributes the ſmalleſt mite to the enlargement of ſcience, confers a benefit upon mankind; nay, even ſome reſpect is due to the failure of a mind aiming at originality. But my antagoniſt ſeems to think with the poet,

'Be not the *laſt* to lay the *old* aſide;
Nor yet the *firſt* by whom the *new* are tried.'

Truth and nature are the ſame; and in writing on a ſubject like planting, if it be admitted that ſome have correctly treated it, then it inevitably follows, that if I would wiſh to be in uniſon with truth and nature, there muſt be ſome points of ſimilarity between myſelf and other writers. But I deny that my book is ſo replete with the ideas of any man, or ſet of men, as to baniſh all original ſpeculations of my own; and I *will* deny, with ſtill greater firmneſs, that I have adopted the opinions of *thoſe writers* alluded to by Muratore. Let any one acquainted with them read my book, and judge of the fact. The truth is, I availed myſelf principally of the ideas of Price, Knight, Gilpin, and De Liſle, ſo far as they were in uniſon with my own *preconceived* notions. Such a combination of original with generally received maxims, I eſteemed to be the proper ſcope of an author who wiſhes to produce a treatiſe upon uſeful and ornamental planting, and more eſpecially, if he have it in view to afford his opinion, upon this ſubject and its correlative ones, to gentlemen laying out their grounds.

Having ſaid thus much in juſtification, I will now ſay a few words by way of *exultation*, if I can poſſibly exult over ſo poor an adverſary! But it is a juſtice I owe to myſelf (and I hope your readers will pardon the apparent egotiſm) to ſay, that this very work which Muratore has decried as a maſs of abſurdity and plagiariſm, will bear compariſon with any ſimilar publication that has appeared ſince the days of Evelyn; and I fearleſsly provoke the inquiry, conſcious of the ſtrength of my aſſertion. The only production on planting publiſhed previouſly to mine, was one by Mr Nicol; and if mine be compared with his, I have little doubt but it will be

be found to contain as much originality as his, when compared with Marſhall, or this laſt with Millar, Hanbury, &c.; nay, I will add, that the firſt, ſecond, and fourth ſections of my work are ſo far my own, that I do not remember to have ſeen their ſubjects treated of by theſe, or by any other author.

I ſhould have been the laſt man who would have deſcended to ſuch autology, or have obtruded any opinion of my work, had I not been called upon ſo to do by imperious neceſſity. To have left my defence in the hands of others (ſuppoſing, if poſſible, that any perſon would aſſume voluntarily the unpleaſant office), would have appeared either culpably neglectful, or proceeding from an inability to vindicate my own doctrines. When I therefore reſolved to undertake this reply, I felt that it was impoſſible to conduct it with ſufficient availability, without deſcending to thoſe particulars, which, to a ſuperficial mind, may appear like egotiſm. In fact, there was no other way, by which I could detect the malignancy and mendacity of my opponent, but by entering into ſuch details. Theſe remarks will I hope have due weight with every candid reader, and likewiſe apologize for obſerving further, that, until the appearance of *my* publication, no work had attempted to combine in one point of view, both uſeful and ornamental planting.

Thus, I have conſidered, and I believe *refuted*, the firſt probable meaning of the gentleman's aſſertion; but, as his ſapient remark is capable of being contemplated under two other aſpects, I will, in juſtice to him, give them a ſlight conſideration.

If he meant to ſay that my work is principally compoſed of quotations from the authors already mentioned, I will juſt hint to him, that the whole of them which I have uſed, if put together, would not occupy four pages! And now for the third application of this triple-faced aſſertion.

Does the *gentleman* mean to inſinuate that I have availed myſelf not only of the *ideas*, but the *expreſſions* of other authors, without acknowledging them? If he does, I demand him to make good his aſſertion in the ſubſequent number of this Magazine. If he does not mean this, it is evident that he has made an aſſertion which cannot be juſtified.

I now come to a part of Muratore's letter, which demands a more ſerious reply than perhaps any other: indeed, he muſt be aware, or, if he be not, I now inform him, that a court of juſtice would have given me redreſs for ſo infamous an aſſertion.

'Another gentleman,' ſays he, 'had heard the author recommended as a *maker* of hothouſes on a new conſtruction; but his improvement turned out to be an imitation ſo imperfect of thoſe

conſtructed by Mr Hay, gardener to Mr Niſbet of Dirleton, *that the one half of the houſe was heated too much, and the other too little.*'

The accuſation contained in the above paragraph, I abſolutely and utterly deny. The only ſimilarity that can be ſaid to exiſt between my hothouſes and thoſe of Mr Hay is, that he admits heated air, and ſo do I. Let me aſk Muratore, if, in mechanical operations, much does not depend upon the means employed, as well as the effect produced? One man, to let in air into his dwellinghouſe, will take off the roof, while another will be content with opening the window. It is evident that they both get air; and it is likewiſe evident which of the two gets it in the beſt manner. But, in truth, I cannot help aſcribing this obſervation to the malignancy of the writer, rather than to any juſt motive in his own mind.

Hitherto, Muratore has been but the echo of an echo, and given, in the quality of reporting clerk, the opinions of others. But now he proceeds to relate to the company, in a very formal ſpeech, with an exordium and peroration not unlike a Hockly-Hole orator, that I have laid down 'new and ſtrange doctrines' (by the by, I believe, new is generally ſtrange), and one which he, and every perſon who has the leaſt experience in building, have found to be impracticable. For the ſake of thoſe who may feel any intereſt in this controverſy, I ſhall quote this 'ſtrange doctrine' from my own book, page 146.

'When lime is employed, if, in place of ſlaking it, and letting it lie to mellow or four for ſome weeks, no more were ſlaked and made ready for uſe than what was worked up the ſame day; if the ſand were clean and rough, and well incorporated with the lime, and were the coping put carefully on, theſe walls would laſt an inconceivable length of time. Lime uſed in this way binds immediately, and the longer it ſtands becomes the harder. Hence, the ſurface of the wall would acquire a coating of moſſes, which would add greatly to its beauty, and prevent decay.'

Here alone I am vulnerable. But let not Muratore triumph; for if I know little, he knows nothing. In reality, building being no direct part of my profeſſion, it may readily be ſuppoſed that my information upon the ſubject is ſomewhat limited; yet not ſo much ſo, but that I can diſcover Muratore to have written without underſtanding it at all. Let any unprejudiced mind peruſe what Dr Anderſon has ſaid in his '*Eſſays on Lime*;' and if he be at all converſant with chemiſtry, and the practice of our beſt architects, he will be at once convinced, that neither the opinions of Muratore or Mr Adams, are founded upon the modern improvements in ſcience. To the general reader it will be need-

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leſs to unfold theſe principles, as he muſt be convinced by facts; and therefore, I ſhall obſerve that the Earl of Wemyſs's park wall at Goſsford, Eaſt Lothian, was built preciſely after this ſyſtem: that the Earl of Mansfield's (by both of which noblemen I have had the honour of being employed) houſe at Caenwood, Hampſted, near London, was built of brick; and, inſtead of being coated over with Mr Adams's compoſition, as the front of the Edinburgh Infirmary is, to imitate ſtone, it is covered with mere lime and ſand, exactly in the ſame manner as laid down in my work. The ſame nobleman's caſtle at Scone is at preſent building with lime, no more of which is ſlaked in the morning, than what is to be uſed during the day. *

Muratore very ſagaciouſly infers, that becauſe his 'experience' informs him I am wrong in regard to mortar, which is confeſſedly diſtinct from my profeſſion, I muſt neceſſarily be unacquainted 'about trees,' to uſe his own expreſſive language. Strange reaſoning this! A candid mind would have drawn juſt a contrary concluſion. I remember to have heard of a taylor, who once undertook to bake his own mutton pye: he invited a baker to dinner with him; but the cruſt being overdone, and the gravy fried out, the baker very ſapiently inferred, that Snip could not make a pair of breeches, becauſe he failed in baking a pye!

Muratore alſo objects to that part of the laſt quotation, wherein I have obſerved, that walls, when they acquire a coating of moſſes, are leſs liable to decay, and much improved in beauty. I muſt inform Muratore, that there are two ways of arguing; one like a man who is maſter of his ſubject, and the other like a woman who knows nothing at all about it. This laſt appears to be a favourite method with my antagoniſt. He ſays, that this idea of mine is a 'conceit,' *in which* I ſhall find few to join me, but *at which* many will laugh: and this is all he does ſay; and I ſuppoſe it is ſo, becauſe he ſays it is. But I, who have never been accuſtomed to pin my faith upon the *ipſe dixit* of any man, muſt beg leave to retain my opinion in ſpite of Muratore's. If he really imagines that my ideas upon the ſubject were wrong, why did

* When Mr Atkinſon, the architect, firſt introduced this, the maſons objected to it nearly upon the ſame ground as Muratore has done; but *they* were ſoon convinced of its ſuperiority. The ſame thing took place at Millburn, near Edinburgh, the ſeat of Robert Liſton, Eſq.; but the mortar becoming ſuddenly much harder than they had ever been accuſtomed to witneſs, their clamours were ſoon ſilenced, and they acquieſced in its propriety. So much for the candour of ſome maſons! I have the ſatisfaction of learning from Mr Liſton himſelf, that this had been adopted in conſequence of the remarks in my book.

he not correct them by ſome of his own, which perhaps might have been right?

The ſame natural propenſity to blunder, is evident in that part of Muratore's letter, where he ventures to talk about *lines of beauty*. I confeſs, when I read the paragraph, I began to ſuſpect my own information, and was about to concede to Muratore a ſuperiority in book knowledge. For a moment, I apprehended that I had hitherto been unacquainted with a moſt valuable work of Hogarth's. I laid down the Magazine, and was juſt about to explore all the bookſellers' ſhops in Edinburgh for *Hogarth's book upon Taſte*, being naturally ſolicitous to read whatever had been written upon this ſubject by a man who ſo well underſtood its principles. Many a '*ſerpentine line*' ſhould I have made in my purſuit, had I not luckily reflected, that a man who appears to have but three ideas, two of them not his own, and the third incorrect, might poſſibly uſe the *laſt* in ſpeaking upon this ſubject. And as I had early been acquainted with *Hogarth's Analyſis of Beauty*, I immediately thought that Muratore had only written one thing, and meant another. All that I ſhall ſay upon this ſubject is, that I am fully prepared to vindicate every thing which I have advanced upon the principles of taſte, either in that part of my work which treats on planting, or in that which relates to landſcape.

And now I take my leave of Muratore. To the well-meant and ſenſible corrections of able men, I ſhall always be attentive; a candid mind feels a pleaſure in renouncing an error; but to the illiberal attacks of envy, prejudice, or malignity, I will for ever oppoſe a determined reſiſtance, with the ſame ſpirit that a man repels an aſſaſſin or a robber. If Muratore ſhould be induced to reply again, I forewarn him that I will not continue the controverſy, unleſs he forego mean inſinuations, and ſubſtitute open, free, and ſcientific argument. Upon theſe grounds I will ſtill meet him, even though he retain the panoply of a fictitious name; but in any other caſe, I ſhall paſs by, with the moſt perfect contempt, whatever he may advance, and leave him to enjoy the honours of a triumph, where contention would have been diſgraceful, and victory humiliating. From what I have done in this letter, the public may judge that I conſider my arguments as not being *untenable*; and therefore they cannot infer from my future ſilence, under the above circumſtances, that I am driven off the field.

I am, Sir, yours, &c.

JOHN LOUDON.

Edinburgh, June 5. 1805.

To

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

SIR,

AT the requeſt of a reſpectable correſpondent of yours, and with the conſent of Mr Headrick, I ſend you a copy of another of his letters to me, as it may give uſeful information to many people in the north country, who may be in want of fuel. I remain, Sir, your moſt obedient ſervant, ALEX. LOW.

Annfield, January 24th 1805.

DEAR SIR, *Thurſo, September 24th*, 1801.

I now beg leave to fulfil my promiſe of deſcribing the plan I ſuggeſted reſpecting fuel. In this I cannot lay claim to any invention of my own, but ſhall only deſcribe the ſubſtance of what I learnt from a Dutchman who was in this country before the war with Holland commenced, reſpecting the mode of preparing fuel in ſome parts of that country. The people get a ſort of blind coal, in the form of culm or droſs, which does not burn well of itſelf, from the biſhopric of Liege. They have alſo a kind of peat mud in their own country, which does not adhere ſo as to form a peat. Theſe they mix together in certain proportions, and then work them among as much of the clay found in the bottom of their moſſes, as makes the whole adhere in one maſs. The peat earth ſerves to kindle the blind coal; and the clay not only makes the maſs adhere, but alſo ſerves to modify the inflammation, ſo that the whole burns ſlowly and equably. It alſo leaves much aſhes for manure.

They have two diſtinct objects in view in making theſe artificial compounds. One is, to make laſting and cheap fires for heating rooms in cold weather. The other is, to raiſe a ſudden but temporary heat for boiling water or dreſſing victuals.

Suppoſe then you take equal bulks of blind coal culm and of moſs, or of the peat culm from the bottom of ſtacks, or of the powdery moſs from which peats have been taken, and mix them well together. Then work them among as much loamy clay as may be ſufficient to make them adhere.

For making fires to heat rooms, this maſs is either compreſſed in moulds, while ſtill wet, and formed into the ſhape of bricks; or it is formed into rounded balls by the hand, and afterwards dried in the ſun, or under ſheds. When dried, a large grate or hearth-place is filled with theſe pieces, laid regularly with the hand, ſo as to form a ſmall air-hole paſſing into it near the bottom in front, and riſing through its centre to the top. The whole is kindled by a few ſhavings or chips of wood put into this air-hole. The Dutch gentleman aſſured me, that a fire made in this manner will laſt more than twenty-four hours, and throw out an equable and agreeable heat.

For dreſſing victuals, &c. a part of the ſame materials is formed into the ſhape of a cone, or rather the fruſtum of a cone.

Thus, A B is a fruſtum of a cone from 18 to 24 inches high, from 6 to 8 inches broad at top, and from 13 to 15 broad at the baſe.

From A to B, a cylindrical opening or funnel paſſes down through the centre of the cone, of from 2 to 3 inches long, and 1 inch in height, ſo as to contain nearly the ſame ſquare area with the ſection of the funnel.

The cylinder from A to B may be formed by a rounded ſtick thruſt down through the cone while the materials are ſoft; and the opening, C, may be formed by a plug of wood, which is removed after the cone is finiſhed. Great nicety is not neceſſary, and the whole may be done by the hand.

When the cone is finiſhed, allow it to dry as before. Then, if a few chips of wood, heath, or dried graſs, be thrown into the cylinder at A, and kindled by a light applied at C, theſe will ſet on fire the peat and coal in the compoſition of the cone that are next the cylinder.

Owing to the draught, a ſtrong heat will iſſue at A, and ſoon boil a kettle ſuſpended over it, or perform any culinary purpoſe required.

When the purpoſe is obtained, the heat is inſtantly checked by clapping a flat ſtone on the aperture at A, and ſtopping that at C. Thus one of theſe cones may ſerve to dreſs victuals a long time, and with the ſmalleſt poſſible expenditure of fuel. Thoſe who uſe them, ſhould always have a new one ready before the old one wears out.

No ſort of coal anſwers ſo well as blind coal for this compound ſpecies of fuel. I am not certain if I have ſtated the proportions correctly; but they will naturally vary a little as the coal and moſs may vary, and you can eaſily aſcertain them by experiments.

When this is done, I conceive the people to the northward of you, who have ſmall patches of moſs, might find it their advantage to uſe your blind coal as their common fuel. A ſingle cart load would ſerve a moderate family nearly a whole year.

But as the Highland Society have called for information reſpecting the economical uſe of fuel, you ſhould lay the reſult of your experiments, if ſucceſsful, before them. Your coal is nearer

the

the ſea than any other *blind* coal known to me in Scotland, and might prove a treaſure in all the eaſtern parts of the Highlands where the moſſes are exhauſted; and even where this is not the caſe, it might ſave the labour of cutting, drying, and carrying on the backs of ſhelties, ſuch immenſe quantities of peats as are neceſſary for the conſumption.

Having ſtated the ſubſtance of many converſations I had with the Dutch gentleman alluded to, I beg leave to mention, that he was a ſkilful deſigner, and often exhibited ſudden ſketches to illuſtrate his meaning—whether they reſpected the forms into which his materials were to be faſhioned, or the mode of building them, ſo as to compoſe a ſtrong and durable fire. I regret I did not take notes of his converſations, or preſerve his ſketches, and that I have only memory to rely on for the accuracy of what I have detailed. From perſonal knowledge, I can affirm, that the plans I have deſcribed, (if proved, and rendered eaſy by previous experiments), would be of incalculable advantage to a great part of the Highlands of Scotland.

But I conceive there are many ways in which you may employ your blind coal, ariſing from its local ſituation, and wholly independent of exportation. Its utility, in drying malt, and every ſpecies of grain, has been long known; though the conſumption in this way would be too limited to warrant ſinking pits, and conſtructing expenſive machinery. Its power in burning limeſtone is alſo generally known, and happily, you have limeſtone contiguous to this coal, capable of enduring, without melting, the moſt fervent heat your coal can excite.

All naturaliſts concur in the opinion, that blind coal conſiſts of carbon diveſted of petroleum, and other evaporable ingredients which are uſually combined with coal. Your fiery philoſophers aſſert, that theſe ingredients were originally combined with the blind, in the ſame way as they are now found combined with other coals, but that they had been evaporated and expelled by ſubterraneous heat. Your watery philoſophers account for the fact in a different manner. I ſhall leave fire and water to ſettle their differences the beſt way they can, and ſhall only remark, that our world-makers ſeem not to have contemplated nature, except through the medium of a few foſſil chips arranged in a cabinet, or they would have ſeen facts very inconſiſtent with their theories.

But the fact, that blind coal is carbon, ſeems to be well aſcertained: and, ſince there are no viſible marks of ſulphur in the compoſition of your coal, I conceive it may be advantageouſly uſed for raiſing a welding heat in ſmiths' forges.

If found difficult to heat in the open air, or to fly off in pieces, as that ſpecies of coal has a tendency to do, it may be encloſed in a chamber made of fire-clay or brick, having apertures to admit

mit the irons that were to be heated. Bituminated coal does not raiſe the welding heat, till after the evaporable ingredients are expelled from it, and the reſiduum is converted into coak or carbon.

Now, the blind coal is already in this ſtate, with the advantage of being almoſt wholly carbon, with hardly any mixture of earths.

I alſo conceive that your blind coal might be advantageouſly uſed in braſs founderies, and in all thoſe furnaces where it is neceſſary to calcine the coal, that is, to evaporate the bitumen from it before it is applied.

As you have great quantities of excellent ironſtone, I conceive it may be uſeful to aſcertain whether your blind coal might not be uſed inſtead of coak, for charging blaſt-furnaces in the ſmelting of iron.

Theſe things are only propoſed as ſubjects of inveſtigation; and if blind coal be found, in all caſes, to anſwer where coak is now uſed, the trouble and expence of calcining the coal will not only be ſaved, and a conſiderable quantity of carbon, now unavoidably conſumed during the proceſs of coaking or calcining the coal, but a much fiercer heat will be excited. I remain, &c.

JAMES HEADRICK.

BRANCH II.

AGRICULTURAL INTELLIGENCE.

SINCE the publication of our laſt Number, the weather, on the whole, has been variable, often ungenial and unfavourable to the growing crops of grain, though, generally ſpeaking, friendly to the growth of graſs and other leguminous plants. The quarter commenced with cold, ſharp weather, which, however, being dry, proved favourable to the working of turnip and fallow land; but the chief complaint in June was a want of ſunſhine and heat, which, of courſe, kept every article behind. The beginning of July was more complacent, and every thing then puſhed on with rapidity; but the latter part of the month proved more unkindly, and ſince the 21ſt, boiſterous winds and heavy ſhowers, followed often with cloſe fogs, have been very prevalent.

From

From the intelligence communicated to us by our numerous correſpondents, it would appear that an uniformity of weather has in a great meaſure prevailed over the whole iſland, at leaſt that any ſlight ſhade or difference therein may be attributed to local circumſtances. Almoſt the like quantity of rain has fallen in every diſtrict, and the want of ſunſhine has been likewiſe felt in all. Every account concurs with our opinion, that the harveſt will at leaſt be fourteen days later than laſt year; and, had not circumſtances been ſimilar, it is impoſſible that the winding up of the corn farmers' labours could, as with one conſent, have been ſo regularly poſtponed.

The late rains, it is believed, have injured the wheats in a conſiderable degree; and there is reaſon to dread that a continuation of moiſt weather will ultimately prove eminently prejudicial. In ſome diſtricts, both blight and mildew have been diſcovered, and in others the red oaker, or gum, has been obſerved very extenſively. At this time, it would be raſh to offer any thing like a prediction concerning the conſequences of theſe diſeaſes, becauſe they may be leſſened or increaſed according to the nature of the after weather. We cannot, however, avoid noticing, that the preſent ſtate of the wheat crop abundantly juſtifies the opinions given in our laſt, when reviewing Sir Joſeph Banks's pamphlet on the diſeaſes of that valuable grain.

We ſaid in the February Number, that the manufacturing and mercantile intereſts would attempt to get the corn law, paſſed in the preceding ſeſſion, repealed or amended; and exhorted the landed intereſt to ſtand forward and defend themſelves. Our prediction is accompliſhed, though our exhortation proved fruitleſs and unavailing. Indeed, while manufacturers met in thouſands, and ſigned petitions for a repeal, the landed intereſt remained faſt aſleep, and patiently allowed their adverſaries to do what they pleaſed. As the amendments made extend to Scotland only, the Engliſh Members did not interfere; conſequently, a ſmall and ineffectual oppoſition was given to the meaſure.

Our readers may wiſh to know the nature of the amendments made. We ſhall detail them briefly, leaving the commentary to an after occaſion. *1ſt*, The import and export of grain into Scotland is, after the 15th Auguſt 1805, to be regulated by the average prices of the *twelve Engliſh maritime diſtricts*, and not by any reference to the average prices of the country where the grain is to be conſumed. *2d*, The export of grain, whatever is the average of the Engliſh maritime diſtricts, may be ſtopped in any diſtrict, when the prices in ſuch diſtrict, during the preceding week, exceed the import rates. *3d*, Permiſſion for importing grain from the Britiſh colonies in America is extended to ſix months. In fact, the mercantile intereſt have, as uſual, gained a complete victory; for, though the import rates of the preceding ſeſſions are nominally retained, grain may be imported into Scotland when prices are much below theſe rates. A copy of the bill ſhall be given in our next Number.

The grain markets, however, in defiance of the new bill, have lately advanced conſiderably, and there is little chance of a declenſion till the current crop is harveſted. It has been found, that every exertion to import could not permanently reduce the price of grain; and, latterly, the qualities imported have been ſo inferior, that, in many caſes, they could not be uſed without a conſiderable admixture.

This

This has been an excellent graſs ſeaſon, and, of courſe, the demand for lean ſtock has been great. The turnip crop has alſo ſucceeded in almoſt every diſtrict, which neceſſarily will continue the demand for a time, though eventually a glut in the market may thereby be produced. The value of labour has lately increaſed prodigiouſly, though this circumſtance, with much apparent juſtice, is not by many people conſidered as tending to the injury of the agriculturiſt. If he pays a higher price for labour, the conſumer is thereby enabled to afford a higher price for the productions of the ſoil, or, which is nearly the ſame thing, the latter is provided with the means of procuring more of the neceſſaries of life; and thus the balance remains ſtill nearly in equilibrio.

A copy of the new Property Tax Bill has juſt been received from London; and, from a curſory examination thereof, we are enabled to ſay, that the amendments now made on the former complicated and multifarious act will tend to ſimplify the aſſeſſment and collection of that tax. We ſhould have been happy could we have added, that the relief merited by agriculturiſts had formed a part of this bill; but, as the old criterion for aſcertaining their incomes is ſtill retained, very little benefit to them will, ſo far as we have inveſtigated the ſubject, accrue from the recent ſtatute.

The Publiſhers of this Work, in imitation of the laudable and praiſeworthy example ſet them by Sir G. S. Mackenzie, Bart., are ſo good as to authoriſe us to offer, in their name, a gold medal of five guineas value, or that ſum in money, to the author of the beſt Eſſay on the Culture and Management of Wheat. Competitors will, therefore, pleaſe tranſmit their Eſſays on or before the firſt day of January 1806, encloſing a ſealed note, with their deſignation and addreſs, and marking on the cover thereof the diſtinguiſhing motto of their paper; none of which notes ſhall be opened, except the one which belongs to the ſucceſsful competitor.—*July* 31.

Extracts from private Correspondence.

SCOTLAND.

Wigtonſhire Quarterly Report.

The weather was cold and backward till the ſecond week of June, when ſome genial rains were received; but their effects were in a great meaſure loſt, in conſequence of being ſucceeded by cold northerly winds. The grain crops at that time were in a very backward ſtate, though, latterly, they look much better than might have been expected from previous circumſtances. Hay, however, is a deficient crop, being ſtinted by the cold in May, though the paſture fields, which were long bare, are now much recovered. Owing to the want of graſs in the early part of the ſeaſon, not much has been done in the cattle trade; but latterly a demand has appeared, and prices have been offered which will ſoon inſure a ſale. The drain of cattle from this diſtrict, laſt fall, was ſo great, as to induce many farmers not to be in a hurry of ſelling; and theſe circumſtances, combined, occaſioned a greater delay than cuſtomarily happens.

Little

Little grain remains on hand, and from the paucity of ſales, it is impracticable to quote a regular ſcale of prices. Turnips were put well into the ground, and the plants, which are abundant, preſent a moſt healthy and vigorous aſpect. Rain has fallen plentifully for ſome days paſt, which, however beneficial to the growing crops, is highly unfavourable to hay harveſt, which is now in hand.—*July* 16.

Letter from Upper Annandale, 18th July.

'The ſummer commenced with cold and drought, which affected the paſtures and ſown graſſes very much,—blackened the earlieſt potatoes, and alſo the bloſſoms of fruit trees and buſhes,—retarded the growth of meadows,—and rendered the oats on poor ſhallow ſoils dwarfiſh; but the oats and barley, in deep or rich lands, were little affected. The plentiful rains that fell in June revived ſome languiſhing crops, and brought others rapidly on; and the fine weather of the laſt ten days has enabled farmers to cut down the earlieſt ſown graſſes, and to make them into ſummer ricks, without their being touched by rain. The preſent aſpect of crops in this diſtrict is nearly as follows.

'*Barley* in the ear, an abundant crop. *Oats* ſhooting, and moſtly a good crop; Spots dwarfiſh, and particular fields over luxuriant. *Potatoes* every where good. *Sown Graſſes* in general very light; but a decent crop on lands well dreſſed, if alſo well *hained*, through laſt winter. *Meadows* later than laſt ſeaſon, and probably lighter. *Paſtures* much improved by the June rains, and preſent heat. *Turnips* generally promiſing, and moſtly hoeing and ſingling out; Swediſh turnips well ſpread. *Wheat* appears well, but is here only in ſmall quantities. *Flax*, in general, exceedingly thin and bad. *Prices* of cattle and ſheep declined much, but have riſen again of late; and Wool is in demand, at an advance, eſpecially fine qualities. Meat continues at 6d. per lib., and oatmeal ſteady at 2s. 6d. per ſtone. Sown hay 10d. per ſtone of 24 lib.'

Morayſhire Quarterly Report.

The growing crops in this county, eſpecially wheat and oats, wear a moſt promiſing appearance; if any partial failure, it is in barley. Wheat ſeems to have eſcaped the blight; but in ſome fields ſmutt is too much diſcerned. The great danger to be apprehended is from over luxuriancy, if the weather ſets in wet, as the crop in general will be ſome weeks later than laſt ſeaſon. The grain markets cloſed with a ſteady demand. Wheat 35s. to 40s.; Barley 24s. to 25s.; and Oats 17s. to 18s. per boll, Stirlingſhire wheat and barley meaſure. The late permiſſion for the diſtillers to work on 1ſt October in place of 10th November, by whomſoever propoſed, has been a moſt beneficial meaſure for the landed and farming intereſt of the north, and the promoter deſerves their beſt thanks; without this toleration, large quantities of inferior bear, which is now ſold off at fair prices, muſt have lain on hand, and ultimately, perhaps, gone to the feeding of hogs.

Hay is a middling crop. Paſture abundant ſince the late favourable change of weather; and lean ſtock have, within theſe three weeks, experienced a riſe in price, with ready ſale.

Potatoes are good; turnip but partially ſo.

Some

Some farmers among us are now begun to ſow rape after the method practiſed in Northumberland, to be eat off the ground by ſheep and cattle previous to its being ploughed up for wheat. The experiment is not yet brought to maturity, although little doubt is entertained of its ſucceſs.

Two different croſſes of ſheep, the one for a hill, the other for a low country diſtrict, have been lately attempted in this county; the former by an intelligent farmer, is from a South-Down tup (brought north by Joſeph King Eſq. of Newmill), fine wool, long-bodied, black face and legs, with common black-faced hill ewes. The Highland ſhepherd, who had charge of the flock in which this change was introduced, was at firſt moſt averſe to it, fearing the croſs would neither ſtand the winter, nor forage ſo well in the hills, although ſatisfied that both wool and carcaſe would be materially benefited. In all reſpects, he is now quite reconciled to this diſcovery of his maſter's (for here it was never known before); and the owner will be amply repaid, having ſold his wool from this croſs at 22s. per ſtone of 24 Engliſh lib., while for the Highland wool he only obtained 10s., both unwaſhed. If any hill ſheep farmer has a mind to try the experiment, ſome half-bred tups may be had, by applying to the ſecretary of the Morayſhire Farming Club.

The other brood alluded to, is from ſmall white ewes, the aborigines of the country, croſſed with Diſhley tups. Many of thoſe ewes, when judiciouſly picked out, are found very handſome, uncommonly ſmall in the bone, fine wooled, make excellent nurſes, and, if moderately well fed during winter, ſeldom ſuffer in lambing. The wool from this croſs readily ſold this ſeaſon at 25s. per ſtone; and the fleſh ſeems better adapted for thoſe counties where the coalheavers' mutton has not got into vogue, or where, from its ſize, the ſale of ſuch is with difficulty effected. On the whole, it is found to anſwer particularly well in the lower diſtricts of this county, and is worth trying in ſimilar ſituations over the greater part of Scotland, eſpecially north of the Forth.

N. B.—Since the above was wrote, ſome of our beſt wheat fields have been attacked by blight; and as the weather is wet, and much of the grain under the blooming proceſs, an increaſe of the malady may be dreaded.——*July* 27.

Banffſhire Quarterly Report.

A long tract of cold weather, which continued till about the end of laſt month, kept our crops long in a very backward ſtate. Since that period, we have experienced a favourable change, and things are now puſhing on with great rapidity. The barley ſtill continues very defective, particularly where ſown after turnip; a failure now very prevalent with land upon a retentive bottom: perhaps this may in ſome meaſure be owing to the injury done to the ſoil by carting off the turnip. Oats in ſuch caſes ſucceed better, and are frequently ſubſtituted. The harveſt muſt be a late one, which of courſe will render it a precarious buſineſs in ſuch a climate as ours, whatever it may be in more favourable ſituations. The moſt of our grain was brought to market ſome time ago, at leaſt out of the hands of the farmer; and, upon the whole, we have reaſon to be ſatisfied with the ſales and produce of laſt year, as it brings us nearer to a level with the high price of labour and various other expences, than has happened for ſome years paſt.

paſt. Our hay crop turns out much better than was expected; and the paſtures now preſent a luxuriant appearance. For the laſt two or three markets, cattle in good condition were more in demand, and prices rather advancing. Little conſumpt in the butcher market. Beef, 5d. to 7d. per lib. Amſterdam.

The turnips look very healthy, having for the moſt part made a good braird, and eſcaped the ravages of the fly; and what wheat we have has all along maintained a good appearance; ſo that if the next month is favourable, a conſiderable return may be expected from this article.——*July* 25.

Angus Quarterly Report, 25th July.

The moderate rains which have fallen, at intervals highly ſeaſonable and convenient for the country, ſince the firſt week of June, have greatly improved the crops of every kind, particularly hay and paſture-graſs, which had ſuffered conſiderably from the preceding hard, cold, chilling weather in April and May; and, conſequently, the cattle markets all around kept dull till St Peters at Forfar, the 3d inſtant, when buſineſs of that kind began to revive. On Tueſday, 16th, at Stobs fair near Dundee, a briſk ſale commenced; and, there being ſeveral Engliſh dealers, good prices were agoing. Thurſday the 18th, at Paddy fair in the Mearns, a greater number of dealers from the ſouth, and higher prices than had been known there, as is ſaid, for a long while before. And, yeſterday, the 24th, the hill market of Kirriemuir, very little, if any, inferior to the former.

Wheats look ſmilingly rich. Barley in ſeveral places rather thin, but no appearance of deficiency. The proſpect of Peas, as alſo of Lint, generally encouraging. Hay harveſt well advanced, and the crop good; not likely to go above 6d., if ſo high, the ſtone weight. Fruit is a ſcanty crop generally. An antidote, more effectual, and of eaſier application, than hitherto propoſed, much wanted againſt the caterpillar, whoſe ravages upon the buſh foliage of this ſeaſon are like to know no bounds. Meat ſtill high; Beef and Mutton 7d., Lamb 6d. per lib. Odds of 30s. were lately given at our ports for barley of laſt crop, and a guinea offered for a conſiderable quantity of the new. Our fiars, annually and monthly, from Candlemas laſt to this date inclufive, ſtand as below.

	Peas and Beans.	*Wheat.*	*Barley.*	*Cheſter Bear.*	*Oats.*	*Oat Meal.*
	l. s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.
1804. Annual	0 17 10	1 19 3	1 8 0	1 3 6	0 18 11	0 19 2
1805. February	0 18 0	2 6 3	1 9 2	1 3 3	0 18 7	0 18 6
March	0 17 10	2 3 3	1 9 3	1 5 4	0 18 10	0 19 2½
April	1 0 0	2 5 0	1 8 9	1 5 0	1 0 1	0 19 4
May	0 0 0	1 15 6	1 7 6	0 0 0	0 19 0	0 18 10
June	0 0 0	2 2 9	1 3 3	0 0 0	0 17 8½	0 19 3
July	0 17 0	2 6 1	1 6 8	0 0 0	0 19 3	0 19 0

Inverneſsſhire Quarterly Report.

The weather was extremely cold till the middle of June, when fine warm rains ſet in, which benefited the growing crops very much; and now an abundant crop may be expected, though the harveſt will be fully two weeks later than in laſt ſeaſon. Some fields of barley will probably be ready for the

the ſickle by the end of Auguſt; but a general harveſt cannot be expected ſooner than the ſecond week of September.

Grain, the ſale of which had ſtagnated much in the beginning of the quarter, has lately had a briſk demand. Barley in particular has been much in requeſt, and great quantities have been ſhipped for the ſouthward. Sheep and wool have advanced in price. At Fort-William market, where moſt of the ſheep and wool of the North Highlands are ſold, wedder lambs ſold at 7s. to 7s. 6d.; wedder ſheep 20s. to 21s.; caſt ewes 8s. to 10s.; wool unſmeared 9s. 6d. per Scotch ſtone; ditto tarred 7s. 6d. All theſe articles have riſen higher ſince the market, and ſales continue to go on briſkly. The ſale of cattle has been duller than that of ſheep, and fewer have gone ſouthward than in former years. Accommodation at the banks being rather limited, prevents purchaſers from making extenſive ſpeculations.

The Caledonian Canal is going forward with ſpirit; and a great proportion of the work people at this ſide have been employed in making a new bed for the river Neſs, at a place where the canal goes into the old channel. The firſt lock is conſiderably advanced; and, in ſhort, much progreſs is made in every department. The effects of that national undertaking on the value of labour are now, however, ſeverely felt, as a good hand cannot be got to work by the day at leſs than 2s. 3d. or 2s. 6d.; and 3s. 6d. per day, beſides drink, is given for cutting hay. Theſe high wages are occaſioned by the principal contractors at the canal ſetting out ſmall pieces of the work to inferior undertakers, who each have a ſquad of ſix or eight below them; and as the undertaker wheels the firſt barrow, he muſt bribe high, ſo as the ſquad may keep up with him. About one thouſand hands are employed at this end of the canal; and it is a matter of aſtoniſhment, that this number has not increaſed the conſumption of butcher meat in the ſmalleſt degree.——*July* 25.

Mid-Lothian Quarterly Report.

The ſummer throughout has been extremely favourable for dreſſing fallows and drilled crops of every denomination. The turnips have come up freely, and hitherto met with no check from the caterpillar. Theſe, as well as the fallows, are in a ſtate of great forwardneſs, and in fine culture.

Wheat and beans are luxuriant, and at preſent greatly at the mercy of the weather: much rain would prove ruinous to both theſe crops. Oats and barley may be deemed a fair average crop. Many fields of the latter are, however, rather ſlight, and in a degree of foulneſs inconſiſtent with improved agriculture.

Notwithſtanding theſe favourable appearances, the die is not yet caſt: for the crops at preſent are certainly from ten days to a fortnight later than ordinary; ſo that a great deal ſtill depends upon the enſuing month.

The potato fields look well, and are perhaps more free of the curl than in ſome former years.

Hay is a good crop, and the quality excellent, where it has been got up during the previous fine weather; but mowers have been ſcarce. In ſome diſtricts they are only in the midſt of hay harveſt, and in others they have not yet begun. The buyers (ſomething like the manufacturers) think that they ought to have hay at the ſame rate for which they uſed to buy it in good

good ſeaſons twenty years ſince, and are offering 6d. per ſtone of 22 lib. The growers with more reaſon ſay, that with double rents and triple wages, with a train of burdens *additional*, and *unknown* twenty years ago, that even with a good crop and improved management, they cannot afford hay for leſs than 8d. per ſtone; and there the matter reſts. Mowers twenty years ſince were 15d. a day; this year, 3s. 6d. and 4s. a day, beſides beer, or 4s. 3d. without beer.

The paſtures in general are good; and the demand both for cattle and ſheep to England conſiderable, at rather increaſed prices. Beef at Edinburgh, of equal quality, brings rather more money, ſinking the offal, than during the winter and ſpring months—ſay 9s. and 9s. 6d. per ſtone of 17½ lib. The ſtack-yards are nearly empty.——*July* 26.

Letter from Glaſgow, July 26.

'THE Iriſh ports having been ſhut againſt the exportation of all kinds of grain, wheat excepted, for the laſt three months, our importation from thence was confined to a few cargoes of oats, ſhipped before the laſt quarter-day. This, however, together with ſome cargoes from Northumberland and the north of Scotland, have kept our market abundantly ſupplied with that ſort of grain. About 10,000 bolls of wheat, imported from Dantzic into Leith and Grangemouth, came to this market. This has been our chief foreign ſupply, the deficiency of which has been amply made up by the adjacent country, which, laſt year, muſt have yielded far beyond expectation.

'The country at preſent has a fine appearance. Should the weather ſet in dry and ſunny, we may look forward for an abundant crop. At preſent we are buſy at hay harveſt; and ſhould we have dry weather for a few weeks, it will be got up in fine order. This crop has turned out weightier by much than was once expected. Our potatoes bid fair to yield a fine crop. Annexed you have a ſtate of our Markets.

'State of Glaſgow Markets, July 26.

Dantzic Wheat	40s. to 42s.	per boll of 240 lib.
Canada ditto	40s. — 45s.	ditto ditto.
Britiſh ditto	43s. — 46s.	ditto Linlithgow meaſure.
Barley	34s. — 37s.	ditto Stirling ditto.
Bear	30s. — 34s.	ditto ditto ditto.
Potato Oats	25s. — 26s. 6d.	do. ditto ditto.
Common ditto	21s. — 23s.	ditto ditto ditto.
Iriſh ditto	24s. — 25s.	ditto of 264 lib.

Old Hay, 10d. per ſtone.—New ditto, 7d. to 8d.'

Aberdeenſhire Quarterly Report.

THE weather which ſet in cold towards the end of April, continued ſo till the middle of June; but as the ſeed ſown this year was good, and ſeaſonably laid down, and as there were frequent falls both of ſnow and rain, vegetation was only retarded; the plants were not materially injured, nor the crop thinned. When favourable weather returned, the growth came forward with a moſt aſtoniſhing rapidity; and the laſt two weeks of June, and all the month of July having been good, crops of every kind promiſe abundance, whether they conſiſt of wheat, of bear, of oats, or of peas or

beans. Harveſt, however, will be ſome weeks later than uſual; and upon the ſucceeding months we muſt yet depend. The hay crop is a full average one; in many places, the cutting and making is far advanced; in others, it is juſt begun. Clover has been particularly luxuriant this year. The turnip-ſeed came up very rapidly; the earlieſt ſown looks uncommonly well, and the lateſt are following apace. Potatoes are not far forward, but are ſufficiently promiſing. The paſture-graſs, which kept long backward, has lately mended much; indeed, in few ſeaſons has it been better than for a month paſt; and cattle have, during that time, ſold more readily, and at higher prices, than before. Great numbers of them are juſt now on their way to England. There is very little oats or bear remaining on hand, except in the ſtack-yards; the demand having increaſed for theſe articles during the preſent month, and the price, eſpecially for the latter, having advanced a good deal. Of oat-meal there remains in the county, unſold, a conſiderable quantity, there having been little demand for that article during the ſeaſon.——*July* 26.

Letter from Falkirk, July 27.

'THE cold, ſharp dry weather, noticed at the cloſe of laſt quarter, continuing after the commencement of the preſent, kept the paſtures very bare for a long time, which occaſioned conſiderable diſtreſs: they are now, however, much mended. Hay, from the ſame cauſes, is but a light crop, upon the whole, in this diſtrict, although ſome partial good fields are to be ſeen. The late rains and genial weather improved the hay greatly, even beyond expectation; but were too late of reaching us, to recover it entirely. The hay crop is therefore below an average; nevertheleſs, the price will not exceed, if it even reaches 6d. per ſtone of 22 lib. Tron; which proves inconteſtibly, that although the conſumption of that article is increaſed, the quantity produced from the extenſive cultivation of the ſown graſſes is really above the demand; and unleſs farmers ſet ſeriouſly about ſome mode of conſuming it profitably on their own premiſes, it muſt, in ordinary years, prove a very drug in the market. It would not require any deep knowledge in arithmetic, to ſhow how very inadequate, now-a-days, ſuch a price is to the increaſed expence of producing it. The ſecond crop, or foggage, will be abundant. The corn crops in this diſtrict are upon the whole good. Wheat and beans moſt excellent, and certainly promiſe at preſent to be above an average, although the latter are late, and the former ſo luxuriant, that very little rain at this critical ſeaſon would do great miſchief. Indeed, while I am writing this report, it is raining pretty heavy: the wheat fields are already drooping their ſtately heads, and, in the courſe of the laſt two hours, partially lodged; but if the rain goes off ſoon, they will probably get up again. Barley and oats are middling crops. Potatoes look well. We are not likely at preſent to have general harveſt under four or five weeks. The ſeaſon has been favourable for working the ſummer fallows, an important conſideration in the Carſe; and as the cultivation of wheat is increaſing, ſo luckily is our attention turned to this ſalutary, and with us indiſpenſable proceſs. I truſt we ſhall continue ſufficiently old-faſhioned, not to be diverted from it by any alluring promiſes of advantage to be derived from ſubſtituting green drilled crops, to the total excluſion of ſummer fallow altogether,

together. On a part of my fallow break of laſt year, I tried what I have always heard conſidered near fully equal to any fallow, a drilled green crop two years in ſucceſſion. The crop was potatoes, well dunged both years, and alſo limed the ſecond. The potatoes were of excellent quality, though the crop was not large, which is generally the caſe on clay ſoil. The reſt of the field was completely ſummer-fallowed, dunged, and alſo limed. The wheat this year is an excellent full crop on both, though ſown with little more than ſix pecks per Scotch acre; but ſtrikingly better on the fallowed portion. This, however, is not the moſt material circumſtance; for, in point of cleanneſs, the fallowed part is infinitely ſuperior, which no doubt muſt be of great advantage during the whole rotation. Moreover, the fallow proceſs, abſtractedly conſidered, is known ſo powerfully to promote fertility, that a much ſmaller quantity of dung is ſufficient to produce this deſirable effect; and, in moſt ſituations, this is of the laſt importance. Our grain market was for ſome time very dull, with a declenſion of prices; but of late it has become briſk again, with a conſiderable riſe. Wheat may be quoted about 46s. per boll Linlithgow ſtandard meaſure; Beans, 23s.; Barley, 36s. to 40s., both per Stirlingſhire boll; but the laſt is in a great meaſure nominal; for there is very little barley in the market, and it is at preſent greedily ſought after. Oat-meal, 16½d. per peck, of 8 lib. Dutch weight. There is ſcarcely a ſolitary ſtack now ſtanding in any yard in all our neighbourhood; but I underſtand the granaries along the Canal are at preſent pretty well ſtocked. Our butcher market has continued very ſteady. Beef at preſent in retail, 8d.; Mutton, 9d.; Lamb, 7d.; all per pound Tron of 22 ounces Engliſh. The price of labourers continues to riſe; and the difficulty of procuring them, even in this populous diſtrict, at any rate, is increaſing almoſt to an alarming degree; ſo that ſerious apprehenſions are entertained, when harveſt arrives, what is to be done for hands. This evil will be aggravated, from people's fears already inducing them to go about to engage before hand ſuch as can be picked up. Hay cutters are getting from 2s. 6d. to 3s. per day, with victuals; and from 4s. to 5s. 6d. per acre when cut by piece-work: laſt year, it was done for 3s. 6d. and 4s. per acre. Thoſe, I believe, who have cut by day's wages, have not paid leſs than 6s. or 7s. per acre. If theſe things are indications of increaſing proſperity, we are unqueſtionably advancing rapidly to the very ſummit of national greatneſs; if they are evils, they will probably work their own cure. However it may be, the rent of every ſpot of ground that comes into the market augments in a degree that excites ſurpriſe, even with thoſe who ought to have ſome judgment in theſe matters.'

Fife Quarterly Report.

Though the paſture graſs in this county has ſuffered for want of rain, of which very little has fallen for near two months, yet none of the victual crops ſeem to have been in the leaſt checked in growth, from one end of the county to the other; and on all ſoils and climates, the crop appears to be abundant, where the land is, as it ought to be, clean and in good condition.

The wheat is univerſally good, the ear large, and promiſes, if fair and favourable weather continue, to be above an average crop.

Barley alſo very good, eſpecially the early ſown, not inferior to laſt year. Oats alſo good and bulky, and very little laid in the beſt ſoils. Peas and beans excellent; promiſe to be well podded, not being over luxuriant in ſtraw.

Hay in this county, in general, rather a light crop, but conſiderably better than expected a month ago. The price expected to be about 3l. per hundred ſtone. In general, got up in fine order; and the ſecond cutting advancing faſt, as rain is now begun to fall plentifully, but ſo gently, as not to be injurious to the corn crops, and of infinite ſervice to the graſs and potatoes, which wanted nothing but moiſture to make them for certain a very productive crop.

Turnips. In no ſeaſon have theſe done better than in this: every where good; no blanks; nor did the fly attack them. As for the caterpillar, it is almoſt unknown in the county.

Flax. This crop has ſuffered more for want of rain than any other, and will be ſhort and unequal. It will probably, however, produce abundance of good ſeed; and by ſaving the ſeed, the deficiency in value may be made up to the flax raiſer: For hundreds in this county find, from experience, that Scots flax ſeed (where Dutch ſeed was ſown and the crop ſaved) produces flax, equal in weight and fineneſs to foreign ſeed, for one year, but degenerates after. A good deal of ruta baga is ſown, not to exclude common turnip, but for ſpring feeding.

Cattle are in good condition, and numerous, as the high prices occaſioned many to turn their attention to breeding ſome years ago.—*July* 27.

Tweeddale Quarterly Report.

The months of April and May preſenting much froſty weather, vegetation was of courſe greatly impeded; but the ſeaſonable June rains, and the genial heat which followed, ſet every thing in motion, and, with the exception of barley, brought forward a moſt luxuriant crop, ſo far as circumſtances will permit an eſtimation to be made. The harveſt, however, will be late, fully fourteen days behind that of laſt year; and few evils are more to be dreaded by a corn farmer, in this diſtrict, than a late cutting and ingathering of the crop.

Hay harveſt is in hand. Though the growth of graſs was checked by cold in the early part of the ſeaſon, yet the clovers, which laſt year planted uncommonly well, maintained themſelves in the ground till favourable weather arrived, when a rapid growth commenced. The turnip crop, which is rather on a larger ſcale than uſual, is healthy and thriving, and as yet has been free both of the fly and the caterpillar. Sheep markets are higher than laſt year. Wedder hogs at Linton markets ſold from 14s. to 17s.; ſtock lambs of the black-faced kind from 7s. to 9s.; Cheviot lambs from 8s. to 12s. Wool has alſo advanced in price. The riſe is about one ſixth more than what was given laſt year. The keep for cattle being abundant, has increaſed the demand for that article; and good horſes, both for draught and the ſaddle, fully maintain the late high prices. Grain brings nearly the ſame prices as quoted in the Haddington weekly liſt. Some oats remain on hand; but the barley crop is completely exhauſted. —*July* 27.

Roſſſhire

Roſsſhire Quarterly Report.

We have the proſpect of an abundant crop in this county; and now wiſh for dry, warm ſunſhine, to bring it to maturity, as the copious rains during the preſent week will enſure plenty of growth. There is no appearance of harveſt here, even of early oats, ſooner than September, which is fully two or three weeks behind laſt year. Wheat, in the early part of the ſpring, looked in many caſes indifferently, and threatened to be thin and light; but ſince it ſet off in April, it has continued healthy and vigorous, brought forth a fine ear, and, under the preſent moiſt ſtate of the weather, has a better chance of being a good crop, both in quantity and quality, than if it had promiſed more at an early period. Barleys, in ſeveral fields that were early ſown, will be a light crop, which may be attributed to the cold weather in the months of May and June. Oats and peas generally promiſe well; though it is to be feared the latter will be more productive in ſtraw than corn. Few beans are ſown in this county; thoſe that are, have a luxuriant growth, and, having enjoyed fine weather while blooming, may be expected to turn out well. Hay is a weighty crop, but by no means has a favourable harveſt ſeaſon, being all ſtill expoſed during this ſoft wet weather. Turnips uniformly brairded well, and are now a promiſing crop; the firſt ſown twice hoed, and nearly touching in the rows. It however deſerves to be noticed, that thoſe ſown either immediately before the rains we had on the 10th, 11th, and 12th of June, or ſoon thereafter when the land was in a raw ſtate, have made comparatively poor progreſs; and though the ſowing before heavy rains cannot be averted or foreſeen, ſtill we ſhould have a little patience till the land is again in a proper ſtate for ſowing; as, by ſo doing, in the end it will be found that there will be gain in place of loſs by delay. There has been no attack on the turnip plants this ſeaſon by inſects; which deſerves notice.

There was ſome demand for cattle in this county during the month of May; but, ſince that time, till within the laſt eight days, there has been almoſt nothing doing. Several drovers have now come into this and the neighbouring counties of Sutherland and Caithneſs, who are purchaſing briſkly: 30s. a head of advance in price has been obtained on three year old ſtots of from 7l. to 8l. value; and it is agreeable to hear of the demand in the ſouth country markets for live ſtock, which will prove a ſeaſonable relief to the north, from whence, as yet, few cattle have gone this ſeaſon. Good ſtots, in freſh condition, are from 8s. to 8s. 6d. per Dutch ſtone, ſinking the offal. Highland wedders, riſing four years old, ſell freely at from 20s. to 21s; caſt ewes from 8s. 6d. to 10s.; lambs 6s. Coarſe ſmeared wool 7s. 6d.; unſmeared ditto 9s. 6d.; Cheviot ditto 28s. per ſtone. Corn markets, during the month of May, and till the middle of June, were much at a ſtand. Since that period, there has been a demand. Preſent prices are, for common Oats, from 18s. to 20s.; Potato ditto, from 23s. to 26s. per five firlots; Barley, from 25s. to 28s. per four firlots; Peas 18s. per boll of four firlots (24 pints to the firlot); Wheat, from 36s. to 40s. per Linlithgow boll. However, any thing as to buying and ſelling corn is but trifling, the bulk of the crop having been diſpoſed of ſome conſiderable time ago.——*July* 27.

Letter from a Gentleman in Kincardineſhire, July 29th.

'THE weather, during the preſent month, has been favourable to vegetation, and the crops have improved much. The hay crop, which, in the early part of the ſeaſon, looked very thin and poor, will in general turn out a middling crop. The rye-graſs has failed this ſeaſon; but never were the clovers more luxuriant, or in greater abundance. Many farmers have ſuffered by their cattle ſwelling on the clovers. I wiſh ſome of your correſpondents would ſay what they give their cattle when in this ſituation. The cure, here, is to put an egg-ſhell filled with tar over their throats; to keep them in conſtant motion, and prevent their drinking water; and, if very bad, to ſtab them in the ſide with a ſmall knife under the lower rib. When not ſoon obſerved, they are ſure to be loſt.

'The wheat crop has much improved. Oats, peas and beans look exceedingly well, and promiſe an abundant crop; but the bear is thin in general over the county. The market for grain and cattle has taken a ſudden ſtart within theſe four weeks. Oats fetch from 20s. to 21s.; Bear from 28s. to 30s. per boll, and a quick demand. Cattle, particularly good two and three year old ſtots, have advanced from two to three pounds a head.'

Extract of a Letter from the diſtrict of Carrick, July 29.

'THE ſtate of the weather in this county, for upwards of three months paſt, has been all in extremes. The dry weather began about the 12th of April, and continued, with little interruption, to the 20th or 23d of June, with perpetual cold and froſt almoſt every night; and, for eight days out of ten, we had the wind from ſome point of the north: ſo that, at one time, this diſtrict had a moſt unpromiſing appearance. At the period above mentioned, the crops were ſcarce covering the ground. Rye-graſs appeared to be extremely deficient; and the paſtures were ſcarce ſufficient to keep the cattle alive. Since that time, with the gentle ſhowers that fell, and the warmth that ſucceeded, there has a degree of vegetation taken place that ſeldom occurs. Crops of all kinds are looking well, more eſpecially oats, which is the prevailing crop in this part of the country; and if the remaining part of the ſeaſon continues favourable, it is the general opinion that the crop will exceed an average. There is only one thing unfavourable. The late vegetation, as might be expected, muſt unavoidably occaſion a late harveſt, unleſs there ſhall be ſuch a continuance of drought and heat as is ſcarce to be expected in this climate. It may perhaps be owing to the long cold weather, and the ſucceeding moſt rapid vegetation, that the crops in general are uncommonly clean, even of the uſual annual weeds. The ſeaſon has been highly favourable for the culture of turnips, which are looking well, ſo far as they have proceeded; and if a preference is to be given to any part of the crop, it may perhaps be given to the potatoes, which are now cultivated to a conſiderable extent, and are univerſally looking well. Many farmers give a preference of theſe to turnip, and think they have a better crop after the former than the latter. As this is contrary to common experience, it is very much to be ſuſpected that it muſt ariſe from miſmanagement of ſome kind or other.

'The grain markets have continued in a gradual advance. Any oat meal that is to be had is juſt now ſelling at 18d. and 18½d. the peck;

peck; and it is in general ſcarce. Lean cattle, of late, have had a briſk ſale, though no very great advance in price; but indeed the price before was ſo conſiderable, that any material advance was ſcarce to be expected. The ſale of fat cattle here being for the moſt part an annual one, has not yet taken place, at leaſt to any extent; but there are many circumſtances which indicate that the prices cannot be low, otherwiſe the graziers will not be able to keep their ground. The great advance of rent, particularly of fine grazing ground, and the price of labour, muſt be reckoned as the chief. And when to theſe are added the additional heavy burdens now impoſed upon the farmers, and the various riſks they have to run, from late harveſts and precarious markets, it ſhould teach the manufacturers to be a little leſs loud with their complaints than they commonly are.'

Berwickſhire Quarterly Report.

THOUGH the weather continued unſeaſonably cold till near the middle of June, it proved very favourable to the preparation of turnip fallows; and the turnip crop, which has been cultivated on an extended ſcale, wears a moſt promiſing aſpect. Paſturage is abundant; and the hay crop, which is more than half cut, is in general weighty.

Winter wheats are every where luxuriant. Spring wheat alſo looks well, but was late in ſhowing the ear. Barley, though healthy, appears in many caſes to be thin on the ground. Oats are a cloſe crop, but rather indicate a deficiency of ſtraw upon dry ſoils. Peas and beans were late of getting into bloom, but are both very thriving. Upon the whole, the crops at preſent may be ſaid to promiſe well; but much ſtill depends on the weather that ſhall intervene between and harveſt.

There has been little fluctuation in the fat markets this quarter; but lean ſtock, particularly ſheep, has recently experienced a conſiderable advance; and wool has ſold from 18 to 21 per cent. above laſt year's price.

Retail price of good Mutton is 6½d. to 7d.; ditto Beef 7d. to 7½d. per lib. Dutch. Corn markets have, for ſome weeks paſt, been upon the advance. Prices at Berwick, July 27th, were, Wheat 70s. to 75s.; Barley (little in the market) 28s. to 32s.; Oats 21s. to 25s. per boll of ſix buſhels.——*July* 28.

Eaſt Lothian Agricultural Report.

THE ſummer quarter of 1805 has, on the whole, proved favourable to the agriculture of this diſtrict; and, though the weather has been variable, yet none of the early variations were exceſſive, conſequently not injurious, in general caſes, to the growing crops of corn, roots and graſs. The drought of May, while it benefited the turnip and fallow fields, was not ſo great as to impede vegetation; and the fine rains about the end of the month puſhed every thing forward for a while, though a want of ſunſhine in June retarded their after progreſs. Part of July was warm and ſerene, but, towards the concluſion, a ſeries of heavy thunder ſhowers occurred, which lodged many fields of wheat and barley, and ſtopped hay harveſt for a time. From theſe circumſtances, the corn harveſt will apparently be two or three weeks later than laſt year, though, no doubt, much depends on the ſucceeding weather.

Taking the different crops in a general point of view, they may be reported

ported as very bulky in ſtraw; but as to the quantity and quality of the grain that may be produced, nothing as yet can be ſtated with correctneſs. In fact, every one of them except oats are in a critical ſtate, and may turn out either ill or well according to the nature of the weather with which we are viſited for two or three weeks to come. Some mildew, and a good deal of red gum is already diſcernible on the wheat; and as the weather remains unſettled, theſe evils muſt neceſſarily increaſe with rapidity.

The artificial graſſes have, in few ſeaſons, yielded a weightier return than in the preſent one; and the paſtures have almoſt in every caſe been excellent. Turnips and potatoes have thriven well. The former root eſcaped the fly and caterpillar, and promiſes to afford an immenſe ſupply of winter food; the latter are generally free of curl, and full of foliage.

An increaſed demand for grain has lately appeared, and prices have advanced conſiderably. The want of good ſound wheat in the London market occaſioned an increaſe of demand for that article; and the alteration made in the diſtillery law obliged the gentlemen in that trade to purchaſe barley at any price, ſo as they might open by the firſt of October, at which time new grain, in any quantity, will not be fit for uſe. It is ſuppoſed that many oats have alſo been purchaſed by the diſtillers, ſeveral of whom were almoſt bare of old ſtock. At Haddington, on 2d Auguſt, good wheat was 50s. to 51s.; Barley 37s. 6d.; Oats 25s. to 28s.; Beans 20s. to 21s.

A trial is making by a farmer in this county, on a pretty large ſcale, to feed cattle in the yard on cut clover and tares, given to them in cribs and troughs, the reſult of which will be laid before our readers in the November Magazine. At this time it may be ſtated, that the trial promiſes to end ſucceſsfully; and, if ſo, a foundation will be laid for a more economical and beneficial application of clover crops than the ancient way of cutting them for hay, or depaſturing them with cattle.—*Aug.* 3.

ENGLAND.

Letter from Lynn, July 22.

'THE crops on the ground preſent a good proſpect, but the weather here has all this ſeaſon been extremely cold, except a day or two now and then; and the crops at preſent are very backward. Warm ſunſhine is much wanted, as without it we muſt have a late harveſt. The hay crop is weighty, and a great part is already well ſecured. The price of grain is advancing.'

Woburn Sheep-Shearing, 1805.

A very full and correct account of this intereſting and magnificent rural fete has been tranſmitted to us by an ingenious correſpondent in London, to whom our grateful acknowlegements are offered; but we regret exceedingly, that the limits of our Work are inadequate for preſenting the account in its original ſhape; and to abridge it, would not only be doing injuſtice to our correſpondent, but alſo to a Nobleman, whoſe zeal to bring agriculture into faſhion, and diſſeminate improvements, entitle him to our moſt reſpectful conſideration. Suffice it to ſay, that, at this important and diſtinguiſhed meeting, a very large body of agriculturiſts, both practical and theoretical, were aſſembled,—that ingenious artiſans of different deſcriptions

preſented

preſented plans and models of their ſeveral works,—that a number of handſome premiums were judiciouſly beſtowed; and, in ſhort, that the whole proceedings were carried on with marked decorum and dignity. It gives us pleaſure to add, that his Royal Highneſs the DUKE of CLARENCE attended; and, from the teſtimony of a Scotch gentleman who was preſent, we are enabled to ſtate, that his Royal Highneſs expreſſed the utmoſt predilection for agricultural purſuits; and, by his amiable and agreeable manners, furniſhed pleaſure and delight to every one around him. A copy of the premiums for 1806 has been tranſmitted to us, which will likely be ſubmitted to the conſideration of our readers in a ſubſequent Number.

Letter from a Gentleman in Kent, 26th July.

'OUR wheats in general looked well in ſpring, and our ſpring corn went into the ground in very good order; and, from the rains that have fallen, there is a great luxuriancy of ſtraw, and on good lands very much lodged; but from the cold weather we have experienced, every thing is backward indeed, and harveſt muſt be late. From the ſame cauſes, our hay ſeaſon has been tedious, and much remains out at the preſent time; and, till this day, the cold, ſhowery weather has continued. The crop is but a poor one. Sainfoin and clovers were alſo late and long in cutting. Peas and beans have podded well. Fruit is very ſpotty. Apples and cherries, gooſeberries and currants are indifferent. Pears and plums middling; wall fruit plentiful. Our wheat crop, laſt year, was barely the half of an average crop, and the quality never ſo bad; ſo I am clear that our farmers muſt loſe money this year on that crop, at the preſent rents and charges. Our huſbandry expences have advanced in this county full 5d. in the ſhilling in 15 years; in many articles much more. Markets are, however, now on the riſe. Our hops are very ſlight of bine, very full of vermin and much honey, and the crop muſt be a poor one. Wool has a briſk ſale, and advancing in price.

Norfolk Quarterly Report.

THE ſpring and ſummer, though ſo extremely cold, and every way ſo apparently unfriendly to vegetation, do not ſeem to have had any unfavourable influence on the general crops of this diſtrict. The wheat which, during the winter, exhibited a plant, in many inſtances, ſickly and thin, improved greatly in the ſpring, and now promiſes at leaſt an average crop, ſhould it fortunately eſcape blight or mildew, a diſeaſe which, it muſt be confeſſed, the preſent cold, wet, and gloomy ſeaſon is peculiarly adapted to generate. The barley is breaking well into the ear, which appears long and heavy, and I am perſuaded will produce more than an average crop. Peas are alſo promiſing; they, in general, ſtill ſhow a full bloſſom on their tops; a circumſtance which will probably have the effect of rendering the ſample leſs lovely, as the produce from theſe after births may be expected to prove much ſmaller in ſize than thoſe from the elder branches, which are already approaching ſo much nearer to maturity. They will, however, contribute to fill the buſhel; and we may, I am confident, ſafely eſtimate them at a full average crop. From the few obſervations I have been able to make on the oat crop, I ſhould not deem it more than an average one.

Every ſpecies of grain and pulſe has acquired a moſt unuſual length and ſize of ſtem, and the aggregate bulk of the crops muſt be very conſiderable;

a circumſtance which, under the management of judicious farmers, may be turned to great advantage, and lay the foundation for a ſucceſſion of future productive crops. The quantity of manure to be made from ſuch a bulk may be conſiderable, and muſt be an object of very great importance. It will occaſion, however, ſome additional, though we may truſt pleaſing labour to the farmer during harveſt; and, it muſt be confeſſed, ſhould the weather prove unſettled, will materially protract the continuation of it; an object of no mean conſideration, in a ſeaſon when it is not probable, however ripening the following month may prove, that harveſt can be generally begun before the firſt week in September. Both natural and artificial graſſes have produced abundantly, and hay is of courſe low in price, about 2s. per hundred weight. The turnip crop has at preſent a promiſing appearance, but dry weather is much wanted for hoeing it. The price of ſtock lambs is not yet generally fixed; but as the quantity of feed, from graſs and tares, is ſo very abundant, the breeders will probably obtain a fair price for their flocks. At the general wool fair for this county, held at Thetford on the 13th inſtant, that article, from the Norfolk and South-Down flocks, and from a croſs of theſe breeds, ſold ſo high as 3l. 11s. 8d. per todd of 28 lib. Grain, in general, has been looking up for ſome weeks paſt. At our laſt market, the following prices were obtained. Wheat, ordinary, 80s. to 90s., fine 100s. to 105s.; Barley 42s. to 43s.; Oats 27s. to 30s. all per quarter of eight Wincheſter buſhels.—*July* 27.

Yorkſhire Quarterly Report.

The general appearance of the ground under crop is at preſent very flattering. Some of the wheats are ſhort in the ear, while others promiſe a full product. There is, as yet, no ſymptom of mildew, &c. viſible on the ſtalk or ear; but as the old enemy, *ſpring froſt*, occurred in a ſevere degree for ſeveral nights in May, we cannot reaſonably expect all to be ripened free from that or other evils. The added experience of every ſeaſon ſeems to put it out of doubt, that the original and proximate cauſes of mildew are *atmoſpheric*, even if *ſpring froſt* be not the ſole cauſe.

The crops of barley are luxuriant; oats and beans are in ſome degree leſs ſo, but promiſe a good average produce. Peas are very flouriſhing. Rape and flax promiſe well for ſeed. Potatoes look extremely well; of which excellent root the markets have already a full ſupply. Our apple trees are, with few exceptions, entirely deſtitute of fruit, notwithſtanding the fine ſhew of bloom: the before mentioned May froſts blaſted all preceding promiſes. However, the ſtate of the weather for ſome weeks paſt, has been, and now is, uncommonly favourable to every ſpecies of vegetation, and in every ſtage of it.

The firſt crops of clover have been moſtly good and well ſaved; graſs a fair crop, much of which has been dried, and ſtacked in excellent order: Hay may therefore be expected at a moderate price. We have lately had ſome fine and ſeaſonable waterings from heavy ſhowers, which have already made a viſible improvement in the appearance of the new mown meadows, &c. Paſtures are excellent. Turnips are expected to be forward and abundant; the hoeing commenced about ten days ſince. Summer fallows are forwarder than uſual.

The price of grain has been remarkably ſteady during the laſt three months.

months. Large and unexpected ſupplies from abroad have diſappointed ſome ſpeculators, who, from the great loſs among the wheat crops of laſt year, by mildew, &c. in many parts of the country, had eagerly graſped at a profit of 50 per cent. at leaſt on their ſtock on hand, which no doubt would have been amply realized, had the foreign ſupply, with that from Scotland, been wanting. It is preſumed that London has drawn more than half of its ſupply, for the preſent year, from thoſe ſources. The beſt wheat is at 14s.; Rye, 8s. 6d.; Barley, 7s.; Oats, 4s.; Beans, 6s. 6d. per buſhel. Fat cattle are moderate in price; lean rather dear. Beef and veal about 8d. per lib.; Mutton and lamb, 7d. Butter about 1s.

It is a very extraordinary circumſtance, that at a time when great complaints are made of the badneſs of trade; when attempts are made, and ſome with ſucceſs, to exclude our manufactures from many of their beſt foreign markets, and when almoſt every thing ſeems to conſpire againſt the wool market; yet that article is now ſelling at an advance of 10 or 15 per cent. above its price laſt year, which was then thought high. Thoſe in the trade endeavour to account for it, from the increaſed number of mills and other machinery now introduced for the preparing and ſpinning of wool; and they alſo ſtrongly hint their ſuſpicions of the exiſtence of a clandeſtine export of worſted and yarn.——*July* 27.

Letter from a Farmer near Wakefield, July 27.

'Our crops of grain, as far as my obſervation and information reaches, (ſay twenty or thirty miles round Wakefield), in general promiſe far more than an average crop. Wheat is good, ſhoots well, *but late*, which cauſes the riſk in harveſting to be much greater. It is at preſent free from blight or mildew; and the weather being favourable, it is filling in the ear very faſt. This, however, is the critical period. If the preſent weather continues two or three weeks, it cannot fail to be a good crop. Should it come on wet and ſtormy, it would lodge very much, from its great length, and run a riſk of being damaged. I never ſaw barley and beans more promiſing, being every where a full and bulky crop. Oats are the moſt failing, but may be conſidered as nearly an average. Upon the whole, harveſt will be late, though, if the weather continues favourable, we may build upon a ſupply of grain much ſuperior to laſt year.

'Our wool markets are very briſk, and ſeem upon the advance. The long wool from Lincolnſhire and the Wolds of Yorkſhire, is ſelling from 1s. to 1s. 2d.; Short wools from 15d. to 18d. per lib. The ſupply on hand is not great; old wools being exhauſted, and the manufacturers in much want. The turnip crop promiſes to be luxuriant; ſo that we have before us a fine proſpect of winter feed for cattle. We had as fine weather for cleaning the land, ſowing the ſeed, and hoeing this plant, as I ever remember. I uſe the drill ſent me from your country, which pleaſes me much, though the practice does not become general here. The farmers ſay their ſheep would not lye conveniently, and be ſubject to get on their backs betwixt the drills. But I am ſatisfied that the weight of turnips produced is conſiderably more than by broadcaſt; and the practice anſwers extremely well where the crop is to be carried off for cattle.'

Northumberland Quarterly Report.

The weather, through the greateſt part of May, was particularly unfriendly to vegetation. The ſevere froſts not only deſtroyed almoſt all kinds

kinds of fruit, but kept every ſpecies of plants in a ſtate of backwardneſs ſcarcely ever remembered. The hawthorn, which in general flowers the latter end of May and beginning of June, was this year in full blow the latter end of June and firſt week in July. On the 29th May, the oaks are frequently in full leaf; but, this ſeaſon, the buds were only then beginning to expand. A little before this period, the weather changed, and has continued the moſt favourable to vegetation that could be wiſhed.

The wheat crops, both autumn and ſpring ſown, were probably never known ſo generally promiſing on every ſpecies of ſoil. The blooming ſeaſon has been peculiarly favourable; and if the weather continues dry, there can be little doubt of an abundant produce: and I am happy to add, that ſuch a favourable proſpect is not confined to this diſtrict; as I had the pleaſure of obſerving the wheat crops, in the month of April, in ſeveral of the ſouthern, midland, and weſtern counties, in the moſt healthy and flouriſhing ſtate that the moſt ſanguine cultivator could deſire.

Upon dry lands, the barley crop has the appearance of being good; but on ſoils of a different deſcription, it is thin. Oats are every where looking well; and if we are favoured with dry weather, the peas and beans are alſo expected to be equally good.

The fine rains in June were exceedingly favourable to the turnips; and the preſent healthy appearance of the young plants preſents the pleaſing proſpect of a full crop of this moſt uſeful and valuable root. The turnips, as well as ruta baga, that were ſown early, (viz. the latter end of May and beginning of June), ſuffered by the fly, ſo great a ſcourge to the ſouthern counties, but which is rarely ſeen in this diſtrict. The black caterpillar is at preſent beginning to make its appearance in ſome places.

The graſs crops are every where abundant, particularly the clovers.

The harveſt will be late, and this circumſtance has probably occaſioned the recent advance in the corn market. Our preſent prices are—Wheat, 11s. 6d. to 12s. 4d.; Barley, 5s. to 5s. 6d.; Oats, 3s. 4d. to 4s. 2d.; Peas, 5s. to 5s. 2d.; Rye, 6s. 4d. to 6s. 8d.—all per Wincheſter buſhel.

The markets for live ſtock continue much the ſame, therefore need not ſtate the preſent prices; but it may be uſeful to record yearly, in your work, the price of lambs at Yetholm fair, which were this year as follows: Long-wooled lambs from 18s. to 25s.; Cheviot from 9s. to 15s.

The wool market has been higher than laſt year. Long wool has been ſold at not leſs than 1s. 2d. per lib.; and Cheviot wool from 1s. 4d. to 1s. 5d. per lib; a ſtrong proof of the increaſing demand for our manufactures, and a flattering proſpect that the farmers' produce will find a ready market.——*July* 27.

Letter from a Gentleman in Lincolnſhire, July 28.

'The wheat crops of this diſtrict appear at this time very promiſing, as no blight or mildew, hitherto, has been diſcovered; but it is rather too early to form a certain judgement of mildew, the crops of all ſorts being much later than in the two previous years.

'Wool has ſold very briſk this year, namely, from 30s. to 33s. per ſodd, which is an average of 2s. per todd higher than laſt year. We have plenty of old corn on hand, to ſerve until the new harveſt comes in, and the prices are ſteady: Wheat, 60s. to 90s.; Barley, 45s. to 50s.; Oats, 28s. to 30s. per quarter. Our corn crops, in general, appear to be good; hay is a large crop, and well got in.

'There

'There is conſiderable progreſs making in our fen drainage now, although at firſt it did not get forward ſo expeditiouſly as we could have wiſhed. Some of our Juſtices complain of its being upon too expenſive a ſcale; but thoſe that find the moſt fault, know the leaſt about it. I think the engineer's plan of laying out the works will be a very good one when complete; and it is now in ſuch forwardneſs, as to enable the commiſſioners to allot the Wildmore fen this enſuing winter, which contains about 11,000 acres. The Eaſt and Weſt fens may be two years before they are completely drained and allotted.'

Letter from a Gentleman in Wiltſhire, July 28.

'I am happy to inform you, that the general appearance of the crops this year, is very favourable in this county. The lateneſs and coldneſs of the ſpring kept back the hay crop; and the low wet meadow land did not get warmed in time to produce a large crop; but the ſound dry lands have produced plentifully; and the clovers on the beſt lands, particularly on ſands, have been abundant.

'It is, as you very juſtly obſerve, a critical time to judge of the corn crops, and particularly of the wheats; but, as yet, appearances are very much in their favour.

'The wheat crop is very thick in the ground, and on that account will ripen earlier, and be, of courſe, leſs ſubject to the blight, than if it was thin. The bloſſoming time has been a very fair one, though occaſionally interrupted by heavy ſhowers of rain; and though ſome of the wheat is laid by the rains, there is no great harm done yet. As to the blight or mildew, it is impoſſible to ſay any thing of it as yet. The fungus or lichen, which is ſuppoſed to do the injury, is a very ſhortlived plant. It is ſometimes not above three days beginning and completing its ravages. Whatever cauſe keeps the wheat from ripening, is favourable to its growth; miſty rains and want of ſunſhine particularly ſo. For although the ſeeds are doubtleſs always afloat in the air, there muſt be concurrent circumſtances to make them vegetate *luxuriantly*; and, at this time, there is none in their favour, but the expected lateneſs of the harveſt; which, however, now promiſes to be earlier than once looked for.

'The markets here keep *up* ſtill, as you may ſee by the newſpapers; and *good* wheat is in very great demand to mix with the bad ſamples of laſt year, particularly with the wretched ſtuff that has been imported. But the demand is only for the *beſt* wheats, the bad being quite a drug. But while the price of the *beſt* fixes the price of flour and bread, it anſwers the dealer's purpoſe to buy it *at any price*.

'The *barley* crop is likely to be moſt abundant. It is certainly the beſt crop of the year, and promiſes to be much beyond the uſual average, and to ripen as early, or earlier, than the wheat.

'The *oat crop* is ſhort in ſtraw, and would have been much ſhorter, had not the late rains come when they did. We think it the worſt (indeed the only bad crop) of the year in this county; and the price is got up to 4s. 6d. per Winchester buſhel.

'The *beans* promiſed to be a great crop; but the late ones have been attacked with inſects during the laſt fortnight, ſo as almoſt to ſtop their growth. I truſt the early ones were too forward to be injured. But no great quantity is planted with us.

'The *peas* crop is very good indeed.

'The

'The *turnips* have been much mended by the late rains, and promiſe an abundant crop; and winter feed of all kinds ſeems likely to be plentiful.

'The rains have alſo been very favourable to the *potato crop*, and there is every promiſe of abundance.

'Upon the whole, although the late rains have ſpoiled ſome of our hay, and retarded the making of a great deal, I think they have been of infinite ſervice; and we have, from the preſent appearance of things, very much to hope, and very little to fear; at leaſt, if it pleaſe God to ſend favourable weather until the harveſt.'

Letter from a Gentleman in Eſſex, July 30.

'SINCE my laſt, nothing has been more fluctuating than the opinions of agriculturiſts in this county, reſpecting the proſpect of the preſent crops, nor was the weather ever known to be more changeable. Not long after my letter in the firſt of May, we had a general fall of ſnow for two days ſucceſſively, and the air cold and chilly, which was followed by cold rains; whereby the barleys, which had at that time made a moſt flouriſhing and flattering appearance, received ſo ſevere a ſhock, as to leave an indifferent proſpect of an average crop. We are, however, after having our minds thus anxiouſly exerciſed, in a great meaſure relieved by the proſpect of a fair crop. Oats promiſe an abundance. Wheats appear upon the whole to promiſe an average. We have had ſeveral mildews, which have affected the fruit trees; but it is not yet perceiveable upon the wheat. The *red gum*, which is attended with a maggot, is general; but although it will of courſe be injurious, ſtill we think not to that extent which has been felt ſome years paſt. Peas and beans look well. Hay is moſtly cut and ſtacked; but the time has not been ſo favourable for theſe operations as we could have wiſhed.

'Hops have a moſt pitiful appearance; ſome of the plants are entirely devoured by the inſects. There cannot, we ſuppoſe, be half a crop, and very likely much leſs; but if, on the contrary, there had been a full average, it would have been of ſmall conſequence to the grower, there being ſo many old in hand: the price would not, with the duty, be adequate to the expence of cultivation. Turnips and cabbages have planted well. Cole-ſeed is now harveſting, of which there is great plenty, as to extent and bulk. Thraſhing machines ſeem to be coming into more general uſe. But the end for which they were firſt propoſed, as being ſo eſſentially uſeful to the farmer, (namely, to remove that dependency upon the men to which we are always liable by the flail), is quite forgot. The raging idea now is, to have machines which will thraſh a large quantity in the day, ſay 20 or 30 quarters, or more; but which do not ſhake and dreſs the corn at the ſame time. It may be aſked, where is the utility of all this, or in what reſpect is the object anſwered? I had an opportunity lately of ſeeing one of this deſcription: it thraſhed a waggon load of oat-ſtraw in about eight minutes; the ſtraw was thraſhed clean, but the chaff and corn came from the machine in ſuch a confuſed manner, as rendered it totally impoſſible to keep them from each other, without putting ſome corn out with the ſtraw. Where then is this dependency removed? The corn is certainly cleared from the ſtraw; but it is far from being well ſhaked up before it is laid aſide. Does any man of common ſenſe ſuppoſe that two or three

three men can ſhake a load of oat-ſtraw, and clear it from the corn and chaff, when in ſuch a promiſcuous ſtate, in eight minutes? We certainly want a little more information from the Scots farmers, and it is highly eſſential; for by introducing machines, which, after the novelty of them is over, are liable, from their imperfections, to be diſcontinued, the country may in a few years be unhappily prejudiced againſt thraſhing machines, even of the beſt character and principles.'

Letter from London, July 29.

'THE extra demand on this market for wheat, which I ſome time ago concluded muſt be made before the new crop could be come at, (from the deficiency of laſt crop in ſome of the principal wheat counties), has taken place ſome weeks back, and ſtill continues. Very large ſales have been made of the good Dantzic wheats, at a material advance; fine ſamples of Britiſh wheat have advanced in a greater proportion, being much wanted to mix with foreign, and the quantity of fine wheat at market would have been inconſiderable, but for the ſupply from the ſouth of Scotland, which has continued great beyond expectation. The appearance of a late harveſt has doubtleſs contributed to this advance; and the ſupply of flour from the interior and the northern coaſt has very much fallen off within theſe laſt two months. There has a very conſiderable advance taken place in both barley and malt of late, without any great demand for either; but the ſupply has been equally ſmall of both. Beans and peas have been on the advance for two or three weeks; and the price of oats is alſo conſiderably higher, from the various and large demands on the market for that article; and in the abſence of foreign ſupplies, our market is immediately affected. The general appearance of the growing crops is good; but the harveſt will be late. There is no proſpect of its commencing ſooner than a fortnight, or probably three weeks hence. We had very cold weather all the month of June and beginning of July, which cauſed a backward hay harveſt; but, from the frequent ſhowers we have lately had, the laſt cut will be much greater than the firſt of the harveſt. There is yet a conſiderable quantity to get in: we have had warm weather for about a week paſt; and, ſhould we be favoured with a continuance of it, I hope the corn crops will be good.

'The appearance of the hops in Kent and Surry is ſuch, that they are conſidered utterly incapable of producing more than a quarter of an average crop; in conſequence, prices have conſiderably advanced.

POSTSCRIPT TO SCOTISH INTELLIGENCE.

Letter from Haddington, Aug. 9.

'The late heavy rain was followed, on Monday laſt, by a tornado, or high gale of wind, from the weſt, which ſeverely injured the growing crops, eſpecially thoſe of wheat, beans, and peas. It is now apprehended that the firſt mentioned grain will, in many caſes, be of poor quality, much of it being lodged before it was ſufficiently filled; and, ſince the gale of wind, a great part is diſcovered to be blaſted, conſequently, in a ſtate wherein no further improvement can be expected.'

NOTICES

NOTICES TO CORRESPONDENTS.

Having a great many *Original Communications* on hand, the REVIEW BRANCH is poſtponed for this Number, which enables us to preſent a few more than could otherwiſe have been accompliſhed. Some of our correſpondents betray ſigns of impatience, becauſe their favours are not inſtantly laid before the public, though a little reflection would teach them, that a prompt obedience to their deſires is not always in our power. Every attention will, however, be paid to the communications ſent us; and we return thanks for the liberal ſupport daily experienced.

We are glad that the EDDLESTONE CLUB have profited ſo much by the advice of Mr A B C, or, more ſtrictly ſpeaking, that we and our readers are to profit ſo much thereby; and thank Mr SECRETARY for communicating a valuable and intelligent paper *On the Endurance of Leaſes*, read at a late meeting. This paper diſcovers a knowledge of the law and practice of Scotland, equal to what might have been expected from the profoundeſt of our legal practitioners.

As NORVAL GRAMPIUS has not choſen to ſatisfy us on the point which we wiſhed to have elucidated, his ſtrictures on the Exciſe laws are of courſe poſtponed.

Our old friend *S. E.*'s Letter on the *Feeding Byre* is received. This gentleman, for a reaſon formerly given, may at all times depend on obtaining every mark of our attention.

The Queries on the ſubject of *Braun*, obligingly furniſhed by a reſpectable correſpondent, could not at this time be overtaken. They ſhall, however, appear in our next, together with an eſſay *on the Benefit which Farmers would derive from the Study of Botany*; and various other favours formerly noticed.

If FLAMINIUS chooſes to put his name to the paper which he lately ſent us, we ſhall not fail to publiſh it. He deals much in truiſms, therefore can be under no difficulty of authenticating them by his real ſignature.

We omitted to notice in the proper place, that the premium offered by Sir GEO. S. MACKENZIE, to the author of the beſt eſſay *on the Storing of Turnips, &c. for Winter and Spring Conſumption*, has been adjudged to Mr WILLIAM PANTON, farmer at Black Ruthven, near Perth. The eſſay is included in this Number. A Premium, to the Author of the beſt Eſſay on the Culture of Wheat, is offered in this Number by the Publiſhers. *Vide* Leading Article of Intelligence.

No. XXIV. will be publiſhed on Monday the 11th of November.

ERRATUM.

Dele, in this Number, p. 289, 20 lines from bottom, one of the words *magneſia*, which word has accidentally been repeated in the ſame line.

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